

**Comment and Response Record  
For  
Hanford Site Groundwater Strategy  
Protection, Monitoring and Remediation  
DOE/RL-2002-59, July 2003**

## **Tom Stoops of the Oregon Office of Energy COMMENTS ON THE HANFORD SITE GROUNDWATER STRATEGY**

### **General Comments**

#### **Establishment of an End-State**

1. Please revise the bullet "Protect and remediate groundwater considering the cumulative impact of waste remaining at Hanford, regulatory requirements, and stakeholder values.", to include "restore groundwater to its highest beneficial use".  
(bullet 3 on page 2)

**Response: This statement is included in the Mission Statement.**

2. Prioritizing sites by risks relies on planning to an assumed or actual end states. This will require an effort by TPA members and stakeholders to define end states. (Page 5, bottom bullet)

**Response: For remediation decisions, the Comprehensive Land Use Plan provides sufficient information for prioritization decisions.**

3. Section 5.2.1 seems to be saying that when the Tri-Party Agencies must decide on whether to proceed with plans they have made for cleanup, or compliance with regulations and laws, that the decisions will be biased in favor of plans. However, we believe the authors are trying to say that when a contradiction in regulations occur a decision will be made to do the right thing. Suggest that the paragraph be re-written to simplify the point and communicate it clearly.

**Response: We agree, this paragraph has been clarified.**

4. The continued use of a core zone and stating that degradation in the core zone is allowable, without stakeholder involvement and consensus, is not an acceptable project premise. It may be more clear to state that the near term goal is the restoration of groundwater beyond the 200 Area, to be followed by the restoration of groundwater within the 200 Area.

**Response: Agree. Preventing further degradation of groundwater is a guiding principle of the document – inside and outside the core zone.**

5. Please add an appropriate statement regarding the need to include stakeholders in the DQO process.

**Response: As appropriate, the state of Oregon and Tribes will be consulted when developing DQOs.**

6. In the vision statement it is imperative that DOE include a statement on stakeholder involvement. Without early stakeholder involvement and meaningful efforts to incorporate diverse views, otherwise the strategy will be hobbled at its onset.

Suggested goal statement: To incorporate the diverse views of stakeholders and to establish remedial endpoints balancing the many needs and desires possessed by stakeholders.

**Response: Section 3 identified stakeholder values as an important consideration in the groundwater protection and remediation program. Section 6 identifies communication with stakeholders and Tribal Governments as an important part of the strategy. The details of implementing stakeholder and Tribal interaction are provided in “Hanford’s Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68, March 2003” consistent with the TPA public involvement requirement.**

7. The discussion of the DQO process should include a discussion on the presentation of preliminary results to stakeholders to attain buy-in for the specific items being discussed. As mentioned in EPA's 2000 Data Quality Objective Process guidance, step 1, is the appropriate time to involve stakeholders. Please revise the strategy to clearly demonstrate how DOE will proactively involve stakeholders, and how minority opinions will be collected and preserved. For example, predictive modeling to establish trigger point (a contaminant concentration that indicates the need for additional action) will require significant stakeholder involvement, and should incorporate the numerous heterogeneities identified for the Hanford Site.

**Response: As appropriate, the state of Oregon and Tribes will be consulted when developing DQOs.**

8. Transparency and accessibility are not accomplished by one way communication. They require two way dialogue throughout the process with meaningful input that can and does affect the process and products. Suggest the phrasing be revised to reflect the necessary collaborative approach that DOE will need to undertake with stakeholders in this endeavor.

**Response: As appropriate, the state of Oregon and Tribes will be consulted when developing DQOs.**

### **Refinement of numerical and conceptual models**

9. DOE should consider that one of the goals and objectives to be upheld by the application of this strategy is that the increased understanding, improved scientific conceptual model, and expanded engineering knowledge to be gained will provide the underlying foundation for the decision making process. The decision making process will include many elements not embodied in this strategy, but must clearly be supported.

Suggest the addition of a bullet: Expand the scientific understanding and engineering knowledge necessary to support the decision making process.

**Response: Agree**

10. Minimizing duplication would seem better suited as a goal or objective, as duplication of efforts may actually provide meaningful data and has little to do with the stated goal of protecting human health and the environment. Reduction of duplication may lead to cost reduction, however it may also lead to cost increases as the condition monitored may not be correctly interpreted. For example, measurement of a low concentration in a sample, near the method detection limit, without an appropriate blank sample may provide a numerical value, but not increase the overall understanding of the system. Reducing unnecessary costs is a valid goal, for Section 3.

**Response: The intent of the statement in the vision is to reduce unnecessary duplication of effort in the execution of RCRA/CERCL/AEA program actions. We believe it is appropriate for the vision. The intent is not to reduce specific QA/AC procedures such as blank or duplicate samples.**

11. Vadose zone heterogeneity and thickness, when coupled with the observed prior transport of radioactive and hazardous constituents to groundwater raises serious questions about using groundwater monitoring alone to assess key areas.

**Response: Groundwater monitoring alone is not being used. Geophysical logging is used where appropriate, boreholes and cone penetrometer methods are used to assess contaminant distribution and a study is underway to evaluate the appropriateness and applicability of vadose zone monitoring.**

12. We recommend that the commitment to the TPA groundwater milestones be re-affirmed in this document.

**Response: Section 6.1 indicates that “The Tri-Party Agreement (Ecology et al. 1998) is the primary legal document that provides schedules and requirements to achieve compliance with applicable regulatory requirements and to clean up the Hanford site.”**

13. The geo-chemical behavior of the numerous commingled contaminants and their parent waste streams are poorly characterized and poorly understood. To reduce uncertainty, DOE should embark on studies on the mechanism of contaminant movement in a heterogeneous

vadose zone, including chelation, colloidal transport phenomena, and lateral and vertical transport via preferential pathways and fast pathways. Existing models do not capture or include the dominant chemical and geo-hydrologic phenomena.

**Response: Existing models capture the dominant chemical and geohydrologic phenomena; however improved understanding of the chemical and physical attributes of the system can lead to better decisions. The Science and Technology program is identified as important groundwater protection, remediation and monitoring in the strategy. The Science and Technology roadmap identifies planned actions. S&T and characterization efforts by ORP and RL projects are used to help develop generalized geochemical and hydro geologic models.**

14. Data in the vadose zone show clear preferences for horizontal flow. If this is occurring in the groundwater, it may have significant impacts on the transport rates and concentrations of contaminants in the groundwater. In essence, current models presume that the aquifer is well mixed throughout its depth. If instead, contaminants and surface water do not mix well with underlying water, the contaminants may be transported more rapidly and at higher concentrations in the upper portions of the aquifer.

**Response: The three dimensional groundwater model was developed in recognition of the importance of capturing this phenomenon. The site-wide groundwater model (used in the SAC) does not presume that the aquifer is well mixed throughout its depth, but rather allows contaminants to move in the uppermost layer to better simulate the concentrations observed in the field.**

## **The Oregon Office of Energy (Oregon) Review of the March 2003 Hanford Site Groundwater Strategy (DOE/RL-2002-59)**

Reference is made to the April 29, 2003 Oregon letter to The Department of Energy (DOE) with comments on the Hanford Site Groundwater Strategy

Responses to the comments on the Hanford Site Groundwater Strategy provided by Oregon in the above referenced letter are provided below.

### General Comments

Future revisions of the groundwater strategy should incorporate elements from both the Washington State and Federal “anti-degradation” policies for surface and ground water. This is particularly critical for maintaining the Columbia River’s “Class A” designation. This inclusion is required due to the existing treaties between the federal government and Native Americans that preserve previously existing uses.

**Response: The goal of the groundwater strategy is to prevent further degradation and protect groundwater and the Columbia River. Elements of both the Washington State and Federal “anti-degradation” policies for surface and groundwater are part of the strategy.**

The tasks necessary to meet the overarching objectives of the groundwater strategy should include active goals. The goals currently listed are generally passive and fail to reflect the sense of immediacy that is needed to respond to over fifty years of radioactive and hazardous operations. Oregon recommends that the U. S. Department of Energy (DOE) establish additional action-oriented goals and incorporate them into the next revision of the strategy. Inclusion of action-oriented goals into the strategy will assist program planners in developing future budget submittals.

**Response: Specific actions and goals are provided in the implementation document “Hanford’s Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68, March 2003.” This document is now available. You can access it on the FH Groundwater Protection Program Web site (<http://www.hanford.gov/cp/gpp/>). CDs and hard copies will be available soon.**

As the 1989 Tri-Party Agreement allowed the DOE time to bring the Hanford Site into compliance with prevailing regulations, including site wide ground and surface water regulations, the actions the DOE outlines in this strategy should reflect the goal of bringing the Hanford Site into compliance. Actions to limit leaks from existing conveyance systems and to

minimize run-on and run-off represent a good start, but additional action oriented goals should include:

- 1) Groundwater Monitoring: Numerous wells have dried up and little effort has been expended to restore or replace groundwater monitoring wells. Generation of less data delays the decision-making process and allows contaminant transport to go unchecked.
  - The DOE should present the plan for upgrading the monitoring network. The draft plan should be presented to regulators and stakeholders by the end of May 2003.

**Response: Specific actions and goals are provided in the implementation document “Hanford’s Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68, March 2003.”**

- 2) Technology Development: Following the disbanding of the Site Technology Coordination Group, the DOE has expended minimal resources to develop necessary remedial actions for contaminated groundwater plumes.
  - DOE should present the draft plan for Research and Development tasks required to restore surface and groundwater by August 2003.

**Response: Research and Development tasks are provided in the implementation document “Hanford’s Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68, March 2003.”**

- 3) Long Term Planning: The DOE needs to develop and present a resource loaded lifecycle baseline for groundwater monitoring, restoration, and research. The baseline should be compliant with DOE Orders 413 and 430.
  - The draft baseline should be presented for discussion with stakeholders in June 2003, to allow for review and preparation of budget requests for FY 2005 and beyond.

**Response: Detailed Master Schedules are provided in the implementation document “Hanford’s Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68, March 2003.” These schedules have been discussed with Oregon and other stakeholders. Detailed Life Cycle Planning will be provided by Fluor Hanford to DOE in June 2003.**

- 4) Point of Compliance: The strategy should be revised to clearly indicate that contaminated groundwater beneath contaminated sites will be restored and not allowed to be re-contaminated by waste left in place, including waste from operational facilities.
  - This revision was agreed to with the public in the Columbia River Keeper meetings in March 2003.

**Response: As stated in the strategy the goal is to restore groundwater to the highest beneficial use to the extent practicable.**

- 5) Reflect Anti-degradation Policy: The DOE should strive to reduce the flux of contaminated

groundwater to zero to meet the goals and principals of State and Federal anti-degradation policies.

- The DOE should establish area specific dates when anti-degradation goals will be achieved. Key dates should be presented before the end of FY 2003.

**Response: Within the Hanford Reach, the Columbia River is a class A River. Concentrations of chemical and radioactive constituents in the river are orders of magnitude below ambient water quality standards. Contaminants from upstream, across the river and other agricultural and industrial sources are the primary sources of chemical and radioactive constituents in the river. The Hanford site currently meets the anti-degradation polices for surface water quality in the Columbia River and the situation will only improve with time. The issue is not degradation of the river itself but the potential impacts at specific locations along the shoreline at the interface where contaminated groundwater from the site seeps into the river. These localized areas of potential impact are being evaluated as part of the Groundwater Protection Program.**

6. Maintenance Upgrades: Future maintenance upgrades should be summarized within the strategy document. The implementing strategy should directly reference the project plan document that reflects actions to be taken and actions taken.

**Response: Specific actions and goals are provided in the implementation document “Hanford’s Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68, March 2003.”**



## Oregon Office of Energy Specific Comments by Focus Area

FOCUS AREA	COMMENT
Groundwater Protection	<p>Operation of Waste Storage and Disposal Facilities</p> <ul style="list-style-type: none"> <li>Existing facilities must be operated in accordance with prevailing permit requirements and not require waivers to meet compliance requirements.</li> <li>New low-level waste disposal trenches should meet prevailing hazardous waste site disposal criteria for lining and monitoring.</li> </ul> <p><b>Response: Waste Storage and Disposal Facilities will be operated and meet appropriate State and Federal requirements</b></p>
	<p>Removal or Immobilization of Contaminant Resources</p> <ul style="list-style-type: none"> <li>DOE-RL should expedite the removal of contaminants from uncontrolled sites. Sites such as 618-11 should be temporarily capped, excavated, or otherwise managed to halt and then prevent the continued release of contaminants into the environment.</li> <li>All removal actions should be to return a site to unrestricted use.</li> </ul> <p><b>Response: Expedited removal actions and temporary caps are implemented as appropriate at the Hanford Site. Removal actions are designed to meet the remedial action objectives.</b></p>
	<p>Reducing Natural and Artificial Recharge in Contaminated Areas</p> <ul style="list-style-type: none"> <li>This common sense approach to waste site management should be vigorously implemented by the operations contractor, especially in the tank farms and other areas that contain uncontrolled waste.</li> <li>To determine performance of infiltration reduction actions, DOE should establish infiltration monitoring sites across the Hanford complex, focusing in the Central Plateau to support future waste management activities.</li> </ul> <p><b>Response: Infiltration studies and infiltration monitoring is being conducted at numerous locations on the Central Plateau including at the Prototype Barrier and the Field Lysimeter Test Facility.</b></p>

FOCUS AREA	COMMENT
	<p>Decommissioning Unnecessary Wells</p> <ul style="list-style-type: none"> <li>• With several thousand unnecessary wells that represent fast flow paths into the aquifer, DOE-RL should assign this task a “highest priority” status.</li> <li>• DOE, in conjunction with EPA and Ecology, should establish contractor performance goals for FY-2005, FY-2006, and beyond for the decommissioning of unnecessary groundwater monitoring wells.</li> </ul>
	<p><b>Response: Specific actions and goals related to well decommissioning are provided in the implementation document “Hanford’s Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68, March 2003.”</b></p>
	<p>Science and Technology</p> <ul style="list-style-type: none"> <li>• Alternative Conceptual Models – DOE should use multiple conceptual models to establish effective strategies for managing, restoring and long term monitoring for contaminated sites.</li> <li>• Monitoring results that deviate from numerically modeled expectations should necessitate revisions to conceptual models and numerical models. Revisions should follow a strict configuration management plan to be qualified for decision making.</li> <li>• Remedial Technologies – DOE should continue to push for the development of technologies necessary to clean up all groundwater contaminants, including difficult or recalcitrant species, such as tritium, nitrate, and iodine.</li> </ul>
	<p><b>Response: Agree</b></p> <p>Modeling and Assessment to Support Groundwater Protection</p> <ul style="list-style-type: none"> <li>• Modeling is a scale dependent phenomenon based upon an estimated understanding of the subsurface. Assessment surety must be tied to model uncertainty.</li> <li>• Assessment should be performed to demonstrate the risk associated with multiple future uses, including those uses that depict unacceptable risks. An analysis of unacceptable risk will establish remedial boundary conditions.</li> </ul> <p><b>Response: Agree</b></p>

FOCUS AREA	COMMENT
Groundwater Monitoring	<p>Groundwater Monitoring Framework</p> <ul style="list-style-type: none"> <li>Effective monitoring requires monitoring wells in the appropriate locations. Numerous wells have dried up since the cessation of operations. These wells need to be modified or replaced to provide information necessary to assess remedial performance and monitoring effectiveness.</li> </ul>
	<p>Consideration for Near Term Actions</p> <ul style="list-style-type: none"> <li>DOE should commit resources to restoring the degraded monitoring network at Hanford, and establish a date for coming into full compliance with monitoring agreements and requirements.</li> </ul> <p><b>Response: The Tri-Parties have developed and integrated groundwater monitoring network designed to meet compliance, remediation and groundwater protection needs for the Hanford Site. A revised M-24 milestone will be issued for public comment by the end of June 2003.</b></p>
	<p>Consideration for Final Monitoring Efforts</p> <ul style="list-style-type: none"> <li>DOE and the agencies should commence developing a long-range plan for monitoring the vadose and saturated zones to verify operational and remedial performance including impacted and clean areas.</li> </ul> <p><b>Response: agree</b></p>

FOCUS AREA	COMMENT
Groundwater Remediation	<p>Groundwater Remediation Framework</p> <ul style="list-style-type: none"> <li>• DOE should modify existing treatment systems to prevent the further spread of contaminated groundwater.</li> </ul> <p><b>Response: Specific actions and goals related to upgrade of treatment systems are provided in the implementation document “Hanford’s Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68, March 2003.”</b></p> <ul style="list-style-type: none"> <li>• DOE should establish the point of compliance beneath the waste release site.</li> </ul> <p><b>Response: Points of compliance are established per the appropriate RCRA, CERCLA and AEA requirements.</b></p>
	<p>Initial Remediation Efforts</p> <ul style="list-style-type: none"> <li>• Remedies chosen should effectively treat all removed contaminants and minimize the re-introduction of contaminants above drinking water standards.</li> <li>• Innovative remedies should be field-tested during interim actions.</li> </ul> <p><b>Response: Agree</b></p>
	<p>Final Remediation Efforts</p> <ul style="list-style-type: none"> <li>• Final remediation efforts should restore the aquifer for unrestricted future uses in all locations. Assumptions precluding future use should be stripped from the strategy and replaced with meaningful remedial goals (Appendix C).</li> <li>• Final remedial efforts in the river corridor should stop the release of contaminants into surface water.</li> </ul> <p><b>Response: per the footnote on page 1 of the strategy...</b>  As a regulatory requirement and policy objective in both the RCRA and CERCLA programs “EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. When restoration of groundwater to beneficial uses is not practicable, EPA expects to prevent further migration of the plume, prevent exposure to the contaminated ground water and evaluate further risk reduction.” – 40 CFR 300.430(a)(1)(iii)(F)</p>

FOCUS AREA	COMMENT
	<p>Resource Optimization</p> <ul style="list-style-type: none"> <li>Adequate requests for resources must be made prior to an attempt to balance resources. Plumes entering the river should receive priority efforts to cease degradation of the Columbia River.</li> </ul> <p><b>Response: See response to General Comment 5)</b></p> <ul style="list-style-type: none"> <li>Optimization requires development of a generally accepted prioritization strategy that is an outgrowth of an agreed to resource loaded project baseline.</li> </ul> <p><b>Response: Agree</b></p>
	<p>Remediation of Emerging Groundwater Plumes</p> <ul style="list-style-type: none"> <li>The occurrence of previously undetected contaminants at a vadose zone or groundwater monitoring location should provide input into an assessment procedure that incorporates the finding into the overall remedial scheme. These findings should be the impetuous for revising the previous conceptual model.</li> </ul> <p><b>Response: Agree</b></p>
Implementation	<p>Implementing Documents</p> <ul style="list-style-type: none"> <li>DOE should present the annual project plan and the lifecycle project baseline prior to submitting budget requests. The annual project plan and baseline should contain adequate detail (PBS/WBS/RBS/FBS) to determine that specific tasks are planned for completion to meet goals. If budget authorization does not match the budget requests, DOE should present the revised baseline in a formal change order package for agreement with the agencies.</li> </ul> <p><b>Response: Annual plans and lifecycle project baselines are submitted as part of the DOE budget process per DOE procedures and TPA requirements.</b></p> <p>Communicating Plans</p> <ul style="list-style-type: none"> <li>The communication plan should include specific dates and actions when DOE will provide the results of sampling, analysis, assessment, and prioritization efforts.</li> </ul> <p><b>Response: Specific actions and goals related to the communication plan are provided in the implementation document “Hanford’s Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68, March 2003.”</b></p>

## **CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION COMMENTS ON THE HANFORD SITE GROUNDWATER STRATEGY**

1. Page 1, Section 2 Vision – CTUIR agrees that the fundamental goal of the U.S. Department of Energy's (DOE's) should be to protect human health and environment from the Hanford contamination. This should include protecting cultural resources and assuring that this protection will continue for time frames that recognize a tribally relevant perspective. A strategy should be developed that will minimize adverse effects to ground water during site operations, cleanup, and forever after the site is closed.

**Response: Native American scenarios and tribal perspectives will be considered in cleanup decisions.**

2. Page 2 Section 3 Goals and Objectives – One item mentioned as a “goal and objective of the groundwater strategy” includes the reduction of risk. This risk should be reduced to levels acceptable to the Native American Subsistence Scenario. The risk should also be analyzed based upon the cumulative impact of all waste sources that the environment or any tribal member could be exposed to. This is as opposed to looking at the effects of any one contaminant and its concentrations.

**Response: Native American scenarios and tribal perspectives will be considered in cleanup decisions. The System Assessment Capability allows assessments of the cumulative impact of multiple contaminants and multiple sources to be performed. It has been used to perform an initial assessment and will be used to perform the Composite Analysis to be completed in 2004.**

3. Page 2 Section 3 Goals and Objectives – Minimizing further degradation of ground water during remedial and closure activities should include retrieval of leaked tank waste from beneath the tanks and the removal of the tanks themselves. Leaving these in place will only be a source of future legacy waste. Simply placing a cap over top of these sites would just be hiding the problem for a future generation to deal with. Any caps placed over these sites would have a limited lifespan that could be small compared to the half-life of some of the wastes that have leaked from these tank farms.

**Response: The Tri-Party Agreement will be followed in retrieving waste from Hanford's tanks. An EIS is in preparation that will evaluate the various options for final disposition of the tanks.**

### Page 2-3 Section 4.0 Regulatory Integration

4. RCRA Groundwater Activities – It is mentioned that ground water monitoring around single-shell tanks is a complex special case regarding regulation. These tanks are non-compliant, they have leaked in the past, and they continue to leak today. However, there are plans to continue to use these tanks to manage waste for an extended period of time. In the process of cleaning up waste from these tanks, DOE will be responsible for additional contamination of

the vadose zone and the ground water beneath. The geology is complicated enough where there is not even a good model to characterize the path of these contaminants through the ground. There is a great potential for some lateral movement of these contaminants.

This reinforces the Tribal view that DOE should be responsible for the removal of the tanks and the tank waste that has escaped from these tanks.

**Response: The interim stabilization efforts are nearly complete – these efforts have minimized or eliminated potential for ongoing releases because pump able liquids have been removed. ORP has a plan to retrieve and close the tanks in accordance with TPA milestones and applicable regulations. An EIS is in preparation that will evaluate the various options for final disposition of the tanks. The complex geology is being addressed through the ongoing tank farm characterization work which will address all the single shell tank farms.**

5. Atomic Energy Act Groundwater Activities – According to this section, DOE is required to monitor contaminants in the environment to determine the effects. DOE will identify existing and potential ground water contamination sources and maintain surveillance, but the goal should be the total removal of these sources.

**Response: Source removal and minimizing the impact to groundwater is the goal of the Groundwater Protection Program. Protection actions are discussed in Section 5.1 Groundwater Protection**

#### Strategies

6. Groundwater Protection – Admittedly, once ground water becomes contaminated, it does become difficult and costly to remediate, but not impossible. Capping appears to be DOE's preferred alternative. This, however, ignores the fact that the lifespan of the caps is less than the lifespan of the contaminants left in place. These contaminants will remobilize once these caps have degraded. It is unlikely institutional controls will continue to be in place in a few hundred years to assure contaminants are not continuing their migration towards the Columbia River. As stated in Appendix D, there is a large inventory of long-lived and mobile contaminants in the vadose zone from past leaks from single-shell tanks. These long lived and mobile contaminants have or will impact the groundwater in the future.

**Response: Remedial actions will be selected to protect groundwater. If caps are chosen as a preferred alternative, cap maintenance will be included in Long Term Stewardship actions.**

7. Groundwater Protection Framework – Avoiding new and/or preventing additional contamination from entering the ground water is a primary objective of DOE's. However, the process of removing and cleaning up wastes from the tank farms is expected to generate a significant influx of new waste into the ground water system. Unless there are plans to remove and mitigate for this new influx, the waste left in the vadose zone and the addition of new wastes are unacceptable sources of high-level radioactive waste to the system. Once again, the lifespan of the caps, in the attempt to reduce natural recharge of surface water, will

not last as long as the lifespan of the radioactive waste left in place.

**Response: Leak loss will be minimized during tank waste retrieval. M-45 milestones include requirements for subsurface characterization at SST farms for purposes of evaluating potential impacts of releases during retrieval and will be used in part to evaluate impacts of releases during closure. If caps are chosen as a preferred alternative, cap maintenance will be included in Long Term Stewardship actions.**

8. Consideration for Final Protection Efforts – DOE’s tank retrieval technologies do not focus on the removal of the tanks or remediation of the contamination beneath these tanks. DOE sees the placement of “covers or barriers” over these sites, including the canyon buildings, as the only practicable action to *delay* the entry of these contaminants into the ground water. This is not a long-term solution.

**Response: The Tri-Party Agreement will be followed in retrieving waste from Hanford’s tanks. An EIS is in preparation that will evaluate the various options for final disposition of the tanks. Final closure actions will be determined through the closure plan and the Sitewide permit.**

9. Groundwater Monitoring Framework – When a new plume of contamination is discovered within the boundaries of an existing plume, I would caution DOE’s plan incorporating the assessment or remediation of this new plume into the old plan. New contaminants may have different mobility or chemical characteristics that could interfere with the current remediation, or could migrate at significantly different rates than predicted. It appears that in some instances, DOE will only respond or have an assessment action to new contaminants once they reach an “agreed to threshold”. If levels begin to be detected in the ground water where they haven’t existed before, DOE should be proactive to determine the source before the levels reach a level that is considered critical.

**Response: We agree, DOE will be proactive about trying to determine the source as soon as possible.**

10. DOE states that they will use a graded approach and focus resources on ground water monitoring and characterization of contaminants that pose a threat to the Columbia River or groundwater. Any contaminants left in place will eventually pose a threat to the Columbia River or the ground water. This includes the wastes that have leaked out of the single-shell tanks and canyon buildings. If, as DOE states, the tanks “have a known or suspected inventory of long-lived and mobile contaminants sufficient to pose a threat to the Columbia River or to affect groundwater resources outside of the 200 Areas core zone”, then a plan should be developed to remove these wastes from the system. Leaving wastes in-place is irresponsible. The report also states that one of the plumes associated with the PUREX Plant, iodine-129 is 17 million years. This plume will not degrade in short-order, rather it will continue its migration toward the Columbia River and will remain a potential threat.

**Response: DOE plans to remove the waste that can be removed and take actions to slow and attenuate the movement of what is left so that concentrations in groundwater and the**



**accessible environment will not pose and unacceptable risk to human health and the environment.**

11. The language in many parts of this strategy is very non-committal. An example the report states “when practicable vadose zone monitoring will be considered.”, it does not state that vadose zone monitoring will be done. It is also easy, in the future, to state that it was never practicable to monitor the vadose zone.

**Response: This document provides a general strategy. Specific actions will be developed in implementation documents and/or incorporated in TPA milestones.**

12. It was good to see DOE admit that “waste sites contributing to groundwater contamination in the core zone are likely to impact existing, partially or well-defined plumes”. However, it is disturbing that even though they recognize there will be a problem in the future, there are no planned activities to remedy this situation of further contamination.

**Response: Specific actions are provided in implementing documents such as Hanford’s Groundwater Management Plan.**

13. At the bottom of page 9 in this section, I believe there are a couple of errors. “For these units, the principal monitoring goal is to demonstrate that the engineered unit is performing satisfactorily and providing releases to the environment...” Providing should probably be preventing. Additionally, there appears to be a missing section since the last sentence is left unfinished.

**Response: Agree, the change will be made.**

14. Considerations for Final Monitoring Efforts – This section was particularly disturbing. “...contamination may be left in the vadose zone and the groundwater at levels that potentially exceed standards for protecting of public health and the environment.” This is an issue that must be addressed to protect the health and welfare of the Tribes and tribal people who will be living in this area long after DOE has left.

**Response: We agree, the statement was incorrect and has been corrected.**

15. Groundwater Remediation Framework – The “Risk Assessment” section should include the Native American Subsistence Scenario for the “acceptable exposure levels”.

**Response: Native American scenarios will be considered.**

16. The “Modeling and Assessment to Support Groundwater Remediation” section states that remediation strategies are “oriented to reflect public and tribal values and priorities. The

following are key elements of this strategy.” The last strategy mentioned is “Develop a Hanford Site process to establish alternate concentration limits.” This is clearly NOT a tribal value or priority and should not be stated as such. “Alternate concentration limits” is a way of saying that higher levels of contaminants would be acceptable. This is not acceptable.

**Response: It should be noted that if ACLs are adopted, a series of steps must occur including full stakeholder involvement. EPA requires source control before any ACL is considered.**

17. Final Remediation Efforts – The last bullet is “Implement process to establish alternate concentration limits (ACLs) where required.” This is again not a tribal strategy, goal, nor something the CTUIR wants to see implemented.

**Response: Comment noted.**

Appendix A – There are many places where comments would be appropriate in the appendix, however, many of these have already been stated above. A few points that should be addressed include:

#### Groundwater Remediation

##### 100-HR-3 and 100-KR-4 Operable Units

*Groundwater beneath the 100-D, 100H, and 100-K Areas was determined to represent an imminent risk to aquatic life in the Columbia River. The plumes exceed the aquatic water quality criteria, and the remediation actions for these areas are based on an appropriate dilution factor for the interaction between ground and surface waters based on sampling within seeps and springs.*

This is why CTUIR does not want the pump and treat process to discontinue in places along the Columbia River. These high levels of contaminants pose a threat to the treaty rights of CTUIR. If a barrier is developed to treat these wastes, it should be done with option of continuing the current pump-and-treat process if the barrier is found to leak or not to be as effective.

**Response: The Tri-Parties continue to have active treatment processes in place until the cleanup objective are met, an alternative remediation technology is identified or the regulatory agencies agree that the existing technology is inefficient or ineffective. Please note that we will remove Appendix A because the information is contained in the Groundwater Management Plan.**

##### 100-NR-2 Operable Units

*No aquatic water quality criteria standards exist for Strontium-90, but concentrations entering the river exceed drinking water standards by more than 1,000 times.*

This is again why the CTUIR feels it is very important to not stop the pump-and-treat process at this site. Additional measures should be taken, but the pump-and-treat is potentially forming a

hydraulic barrier preventing larger quantities of Strontium-90 from getting into the system. Deep vadose zone contamination can not be cleaned via phytoremediation, nor a sorptive barrier.

#### 200-UP-1 and 200-ZP-1 Operable Units

There is a massive inventory of uranium, technetium-99, and carbon tetrachloride that remains unaccounted for in the vadose zone. This is partially due to the complexity of the geology. It is difficult to imagine how controls to limit infiltration of surface water will limit or stop any additional migration of these contaminants when DOE can not account for the location of many of them in the First place.

## **NEZ PERCE COMMENTS ON THE HANFORD SITE GROUNDWATER STRATEGY**

1. **Long Term Stewardship** – What is the foundation that will link this groundwater strategy plan to Long Term Stewardship and Institutional Controls? The groundwater strategy plan does briefly discuss long-term monitoring in section 5.2.3. It is important to define “adequate monitoring” and to determine how that will be assured. If monitoring indicates a renewed problem in an area where it was previously considered that protective measures and remedial actions were complete, what mechanisms will assure that the area will be revisited for cleanup?

**Response: Figure 2 shows the decision process that would lead to initiating new or further cleanup. In addition, reviews of the records of decision (ROD) is performed every 5 years and will identify when additional actions are needed. DOE is developing a long-term stewardship plan that can be referenced when it becomes available.**

2. **Balancing Views and Needs** – The ERWM supports a change suggested by the Oregon Office of Energy that a goal be added to the vision statement regarding incorporating and balancing the many views and needs of stakeholders when establishing remedial endpoints.

**Response: Section 3 identifies stakeholder values as an important consideration in the groundwater protection and remediation program. Section 6.2 identifies communication with stakeholders and Tribal Governments as an important part of the strategy. The details of implementing stakeholder and Tribal interaction is contained in the “Hanford Groundwater Plan”.**

3. Recently members of our staff have been invited to participate in two distinct Data Quality Objectives (DQO) processes for two different areas. The levels of participation extended to us in those two processes were grossly different. As a result, we also advise you to revise the groundwater strategy to clearly indicate how DOE intends to proactively and consistently include stakeholders in the DQO process.

**Response: Please note participation in DQOs are project specific.**

4. Define “highest beneficial use” and “highest possible beneficial use.” It is not clear whether these phrases have specific regulatory definitions.

**Response: In general these terms mean to return to drinking water standards.**

**Technical Elements – Vadose Zone** – We advise increasing the emphasis on vadose zone throughout the document. Suggestions follow:

5. **Goals and Objectives** – 2<sup>nd</sup> bullet – add “**and vadose zone**” to the end of the sentence; same addition in 4<sup>th</sup> bullet of 5.3.4. Resource Optimism – “Improve the integration of the existing groundwater **and vadose zone** monitoring networks...”

**Response: A study is underway to evaluate the appropriateness and applicability of vadose zone monitoring.**

6. Groundwater Protection – We suggest the following additional language. 2<sup>nd</sup> sentence: “Therefore, prevention of future groundwater contamination and **remediation or** containment of existing near-surface contamination are the primary ways to protect groundwater,” 3<sup>rd</sup> sentence : “Key activities in preventing future groundwater contamination include **effective sitewide monitoring of both vadose zone and groundwater**, operating and managing properly...”

**Response: Monitoring is discussed in a separate section of the document. Monitoring does not prevent contamination of groundwater, it indicates whether your protection systems are working and when corrective measures need to be taken.**

7. Consideration for Near-Term Action - Suggested rewording for 3<sup>rd</sup> paragraph, 3<sup>rd</sup> sentence: “Improved technologies for removing or immobilizing waste in the vadose zone and preventing its entry into the groundwater and the Columbia **River are imperative to the success of the mission of the Hanford Groundwater Strategy.**”

**Response: The current wording is appropriate.**

8. Consideration for Final Protection Efforts – Similarly, suggested revision of 2<sup>nd</sup> paragraph, 2<sup>nd</sup> sentence: “Continued research into effective methods to immobilize or remove these contaminants **must** be pursued.

**Response: The word “should” will be changed to “will.”**

9. Groundwater Monitoring Framework – See page 9, 2<sup>nd</sup> set of bullets, 4<sup>th</sup> bullet beginning with “When practicable vadose zone monitoring will be considered...” Please clearly define the phrase “when practicable. We do not wish to see the technically impracticable confused with inconvenience and/or lack of funding.

**Response: The applicability of vadose zone monitoring is the subject of a study that is underway.**

10. Implementing Documents - The 6<sup>th</sup> bullet mentions a document or plan for Central Plateau wide study of the vadose zone. What is this specifically? If it is not a specific document, perhaps it should be formalized. Any why would it not include the entire Hanford Site?

**Response: A study is underway to evaluate the applicability of vadose zone monitoring to the Central Plateau. The Central Plateau is the focus of this study because it will be a waste management area for the foreseeable future.**

11. The 4<sup>th</sup> paragraph on page A.4 discusses septic systems still in use in the 200 area. As these

systems provide potential recharge to the groundwater in the 200 area, we support shutting down all septic and waste water systems discharging to the vadose zone in the 200 Area and the remainder of the Hanford Site is expediently as possible.

**Response: Agree. Shutdown of these facilities is planned.**

12. **Minor Editing Elements** – You may have already found most of these elements, but we offer them should you have missed them.

Page 1 2<sup>nd</sup> paragraph, 2<sup>nd</sup> sentence beginning with “To accomplish this goal...” is an incomplete sentence.

**Response: The listed bullets complete the sentence.**

Page 9, last paragraph, 2<sup>nd</sup> sentence – Add “not” between **and providing**, so that the clause reads, “...unit is performing satisfactorily and not providing releases...”

**Response: Agree**

Section 4 – 2<sup>nd</sup> sentence, should MTCA be added to the listing of primary relevant regulatory acts?

**Response: MTCA is included as an ARAR**

CERCLA Groundwater Activities – The 2<sup>nd</sup> sentence states the ten of the 56 Operable Units are groundwater Operation Units (OUs). The Groundwater monitoring Report for 2001 indicates there are 14 groundwater OUs. What is the correct number?

**Response: Ten plus 1100 EM-1 which has been deleted from the NPL but continues to be monitored.**

Page 10, 1st paragraph – This is a continuation of a sentence from the page before “...Subpart F...” should not be indented.

**Response: Agree**

Consideration for Near-Term Action - 1st bullet – We suggest adding MTCA to list of regulatory requirements.

**Response: MTCA is included as an ARAR**

Page A.4 – A.1.3. – 2<sup>nd</sup> sentence. Change cleanup to **cleaned up**. In the same section, 4<sup>th</sup> paragraph, 1st sentence, complete the parenthesis around DOE/RL 2002.

**Response: Agree**

Appendix E – We suggest you also include a copy of the HAB advice # 132 to augment the DOE letter in response.

**Response: We agree.**

## **Response to Greg deBruler, Columbia Riverkeeper, Comments**

1. “The mission of the Hanford Groundwater Protection Program is to protect the Columbia River from contaminated groundwater resulting from past, present, and future operations at the Hanford Site and to protect and restore groundwater to its highest beneficial use. This mission is a key element of the overall Hanford cleanup efforts.” This is a great goal now let’s see if this strategy accomplishes this goal!

**Response: Thank you for the comment. Actions are currently underway to accomplish the goal.**

2. “The fundamental goal of the U.S. Department of Energy’s (DOE’s) Groundwater protection program is to protect human health and the environment from Hanford contamination and is a key piece of DOE’s overall Hanford cleanup strategy....” Shouldn’t the vision be: to clean up Hanford so that it is protective of human health and the environment?

**Response: We agree. The text has been changed to reflect this.**

3. “The groundwater strategy provides a consistent rationale to evaluate protection, monitoring, and remediation activities and identify gaps in groundwater and vadose remedial actions. The strategy guides field activities conducted on the Hanford Site and facilitates annual negotiations between the U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology) and DOE (Tri-Parties) and the related work planning. The Tri-Parties’ goal is to implement a strategy that minimizes adverse effects to groundwater during site operations and cleanup.” What about stopping adverse effects after cleanup? Shouldn’t the goal be: To prevent future impacts to groundwater during site operations, cleanup, and in the future, for as long as the waste remains hazardous?

**Response: We believe our intent is consistent with your statement. No change to the text is required.**

4. **Section 5.2.1 Groundwater Monitoring Framework**

“It is the goal of this strategy to prevent 200 Area contaminants from re-contaminating the aquifer outside of the 200 Area core zone. Attainment of this goal also will assure protection of the Columbia River and its users.” The regulations require cleaning up groundwater beneath a waste site to its highest beneficial use. In most cases it’s the drinking water standard. Not removing, stabilizing, or immobilizing the source of contamination you will never protect groundwater. This goal will not assure the long-term protection of the Columbia River for as long as the waste remains hazardous.

**Response: We agree. This section has been revised to be consistent with state and federal regulations to prevent further degradation of the groundwater.**



5. **Section 5.2.1 Groundwater Monitoring Framework**

“Groundwater monitoring will be performed to support cleanup decisions ....”

So if they put the monitoring in place that cannot detect impacts, they could conclude that cleanup is successful. OR If you limit the amount of monitoring you could also conclude everything is just fine! A constant Hanford theme, if you don’t look, you don’t have a problem! HOW ABOUT: Groundwater monitoring will be performed to assess the effectiveness of cleanup decisions/remedial actions?

**Response: The Tri-Parties were deliberate in the use of the words “cleanup decisions.” We chose these words to make sure cleanup was the driving force. We believe this goal is consistent with your earlier comments.**

6. **Section 5.2.1 Groundwater Monitoring Framework**

“Where cleanup-driven requirements do not naturally match regulatory requirements, there should be a bias toward interpretation and applications of regulations that best support cleanup goals.” A new twist, how we manipulate the law. It’s now their cleanup goals that drive cleanup, not what is legally required!

“It is the goal of this strategy to prevent 200 Area contaminants from recontaminating the aquifer outside of the 200 Area core zone. Attainment of this goal also will assure protection of the Columbia River and its users.” Truly stretches the intent of the law. The point of compliance for a waste site is directly under the waste site and not some arbitrary point out in the distance.

**Response: We agree. The text has been changed to reflect this.**

7. **Risk Assessment**

“Remedial alternatives/goals shall establish acceptable exposure levels that protect human health and the environment....” **Your remedial alternatives/goals is not what sets the acceptable exposure levels, the regulations set what is acceptable. Like 1 in 1,000,000 for one contaminant and 1 in 100,000 for multiple contaminants.**

**Modeling and Assessment to Support Groundwater Remediation.**

“Control the migration of plumes that threaten or continue to further degrade groundwater quality beyond the boundaries of the core zone.” Setting the point of compliance beyond the core zone is not legal. The goal should be to STOP further impacts to groundwater under the individual waste sites and to clean up existing contaminated groundwater.

“Develop a Hanford Site process to establish alternate concentration limits.”

So if we can't meet what regulations require, we just change the requirements so we can leave it even dirtier.

**Response: We agree this text is misleading. It has been changed to reflect our “no further degradation” policy.**

8. **Section 5.2.3 Considerations for Final Monitoring Efforts**

“Once protective measures and remedial actions are completed, contamination may be left in the vadose zone and the groundwater at levels that potentially exceed standards for protection of public health and the environment.” Are the Tri-Parties giving up? They have accepted USDOE's accelerated cleanup, even though it took 45+ years to make this mess. Is it OK to leave massive contamination in the soil?

Do you think the State of Washington, EPA, should let USDOE off the hook just because they have not used the best available technologies and have not invested enough money to create the technologies to deal with these difficult cleanup problems?

**Response: This was a mis-statement in an earlier draft. The text has been changed.**

9. **Section 5.3.3 Final Remediation Efforts**

C3T Groundwater Strategy: “Prevent further degradation of groundwater quality beyond the boundaries of the core zone, and ultimately restore unrestricted use of groundwater beyond that boundary.” State & federal law says that you must protect groundwater to its highest beneficial use. The point of compliance is directly under the waste site. Shouldn't the Tri-Party Agencies abide by state & federal law? Don't you expect them to clean up the soil in the core zone to protect groundwater? Don't you expect the groundwater below the core zone to be cleaned up?

**Response: We agree. See response to comment 4.**

**Groundwater Strategy for Hanford:  
A Contrast in Citizens' Vision and Goals With USDOE's and its Partner  
Tri-Party Agreement Agencies' Vision and Goals**

**Comments of Heart of America Northwest Research Center,  
and Heart of America Northwest  
on the Draft "Hanford Site Groundwater Strategy"; and,  
"Hanford's Groundwater Plan"  
U.S. Department of Energy (USDOE)  
March 2003 DOE-RL-2002-59; DOE-RL-2002-68**

**A Contrast in Visions:**

In 1994, Heart of America Northwest and other public interest groups called for the U.S. Department of Energy (USDOE), Washington Department of Ecology and U.S. Environmental Protection Agency (EPA) to adopt a vision, clear goals and plan to cleanup the Hanford Reach of the Columbia River to allow for use that was not restricted by residual contamination by 2011 ("unrestricted use" under state law). The Columbia River flows through the Hanford Nuclear Reservation for over fifty miles. Much of the shore and Columbia River corridor was designated by President Clinton as the Hanford Reach National Monument, preserving the ecological, geological, cultural and recreational treasures of the last free-flowing stretch of the Columbia River in the U.S., with the last large natural spawning grounds for Chinook (King) salmon on the River in the U.S..

The citizen groups issued a plan, which generated widespread public support at public hearings, calling for the Hanford Clean-Up Agreement to be changed to accelerate cleanup of the Hanford Columbia River Corridor to achieve safe, *unrestricted* public and Tribal use of the Hanford Reach by 2011.

At the time, USDOE was proposing to change the Hanford Clean-Up Agreement to delay vitrification of High-Level Nuclear Wastes. The agencies agreed that the cleanup of the Columbia River corridor should become the focus for near-term cleanup of Hanford, in keeping with the public value for protecting the River and preventing harm to the public and Tribes using the River. (The River Corridor includes the areas with contamination around the nine nuclear weapons production reactors along the River – designated the "100" Areas by USDOE; and, the heavily contaminated "300" area at the southern gateway to the Hanford Reach, just north of the City of Richland, which has over 100 heavily contaminated facilities used to produce nuclear fuel and test processes to extract Plutonium and Uranium, and an old test reactor). Essentially, a deal was struck: USDOE was allowed to delay construction of the massive plants needed to vitrify (turn into glass) Hanford's deadly High-Level Nuclear Wastes, stored in 178 massive tanks, of which 68 have leaked over a million gallons of waste. Those leaks, and future leaks, are a major part of the concern over Hanford's groundwater and the threat it poses to the Columbia River. In exchange for delaying vitrification, USDOE agreed to new Hanford Clean-Up Agreement milestones for cleanup of the Columbia River Corridor. Hanford's top managers

stated that they were committed to achieving the goal of unrestricted public use of the Columbia River corridor by 2011.

This, however, is a promise that has been forgotten and broken – like the treaty rights of the Yakama, Umatilla and Nez Perce Nations. All three tribes have guaranteed rights to live along the River, and fish at usual and accustomed fishing places, under the Treaties of 1855. Exposure to contamination from the soil and groundwater makes the exercise of these Treaty rights impossible today.

Nor is there any hope under the national “strategy” and “goals” adopted by the Bush Administration’s Department of Energy that the Hanford Reach National Monument will be safe for public and Tribal use by 2018, much less 2011. (“A Review of the Department of Energy’s Environmental Management Program”, February, 2002; and, implementation plans in the Hanford Performance Management Plan, “approved” by the Assistant Secretary of Energy for Environmental management, August, 2002). USDOE unilaterally changed the goal for soil cleanup along the Reach from 2011 to 2012, calling this an “accelerated cleanup plan” (or, “Hanford 2012 Plan”). USDOE left out of its “2012 plan” any goal or strategy for cleaning up the groundwater along the Hanford Reach. Rather, the USDOE’s national goals and strategies, and Hanford specific plans call for:

- allowing the contaminated groundwater to spread from the Hanford Central Plateau’s “200 Areas” (200 East and 200 West, where Plutonium and Uranium extraction occurred, and where the High-Level Waste tanks are located);
- changing the “points of compliance” from the edge of waste dumps and contaminated soil sites to the River shore<sup>1</sup>; and,
- using “natural attenuation” with monitoring to allow the contamination levels to grow before they eventually get diluted or the radionuclides decay over hundreds or thousands of years.

#### The Problem Exemplified by the Area of Greatest Public :

##### A summary of how bad the groundwater is along the Columbia River Corridor:

USDOE refused to stop dumping untreated liquid wastes into the soil through the early 1990’s. USDOE was sued by Heart of America Northwest for dumping over 200 million gallons of untreated waste a year from the 300 Area into half mile long ditches parallel to the Columbia River. USDOE’s own documents admitted that even the dumping of pure water into the heavily contaminated soil in and around the 300 Area would “flush” Uranium contamination directly into the River. The soil was, essentially, like a filthy and saturated sponge: every additional drop of water on top caused a dirty drop from the bottom of the sponge to go into the River.

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<sup>1</sup> USDOE, February, 2002, “A Review of the Environmental Management Program”, accompanying the Secretary of Energy’s Congressional Budget Request for FY 2003. SEE Page V-10: “Cleanup of the sites is often further complicated by a lack of realistic future land-use assumptions.... In contrast, the cleanup of commercial industrial sites has assumed continued industrial use. ‘Brownfield’ cleanups are being pursued to support faster cleanups... Another major factor affecting DOE cleanups is points of compliance for groundwater contamination. ... located near areas unlikely ever to be released for public use, unrealistic goals for cleanup are established.” The Review has been followed by several USDOE-Richland plans and strategies (i.e., the Draft Hanford Solid Waste EIS, and Revised Draft Hanford Solid Waste EIS; the draft Central Plateau groundwater strategy and exposure scenario) which would move the point of compliance for groundwater away from the edge of regulated units all the way to the River or to a point one kilometer away from the boundary of the 200 Area.

In the Central Plateau's 200 Areas, USDOE was dumping untreated liquid wastes from the Plutonium Finishing Plant and Uranium Oxide Plants into unlined soil ditches called "cribs" and "trenches". Heart of America Northwest also sued to halt this practice, and require USDOE to treat its waste and get waste discharge permits.

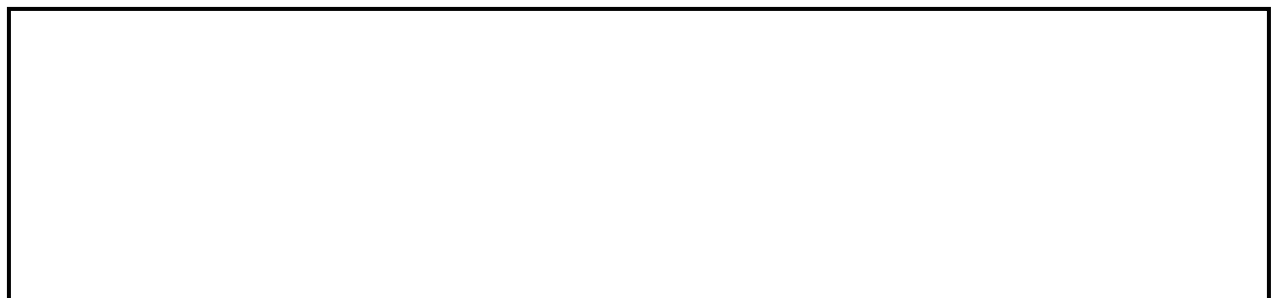
These were not ancient practices. Long after every other industry in Washington and the United States was subject to the requirements of federal and state clean water acts, requiring treatment and permits, and forbidding dumping of wastes in unlined ditches, USDOE claimed to be exempt. Many of the top managers of USDOE today were senior managers in the 1990's, while USDOE fought tooth and nail against being forced to end the dumping of untreated liquid waste into the soil.

In 1989, the U.S. General Accounting Office found that USDOE's claims that leaks from the High-Level Nuclear Waste Tanks had not migrated towards groundwater were known not to be true. USDOE, the GAO found, tried to keep up the pretext that the wastes were not migrating by only measuring wells for a radionuclide that had a half life of six months, and would be expected to have decayed before reaching groundwater 200 plus feet beneath the tanks. It was not until November, 1997 that USDOE admitted what everyone else had known for many years: that tank waste leaks had reached groundwater.

Fifty years of Plutonium production at Hanford and fifty years of claiming to be exempt from environmental laws produced a legacy summarized by Bob Alvarez, former Senior Environmental Policy Advisory to Energy Secretary Bill Richardson, as:

In the ensuing 50 years and after making nearly 60 tons of plutonium, some 440 billion gallons of contaminated liquids were directly disposed into the ground at Hanford-enough to create a poisonous lake the size of Manhattan 120 feet deep. Hexavalent chromium, a well-known carcinogen, is now being found to damage fish in the river, while radioactive contaminants have been carried into ocean sediments ranging as far as the southern tip of the Baja Peninsula in Mexico and as far north as Alaska. According to Timothy Jarvis, a scientist at DOE's Pacific North West National Laboratory enough dangerous materials were dumped at Hanford to have "the potential to induce cancer in every person currently on the planet, 208 million times over."<sup>2</sup>

USDOE admits that 80 square miles of Hanford's groundwater is contaminated above federal Drinking Water Standards, and 200 square miles contaminated to a lesser degree. A model of the spread of groundwater contamination, called the "System Assessment Capability" (SAC) has been produced by USDOE over several years, and costing tens of millions of dollars. While heavily criticized by external reviewers and some internal scientists for underestimating contamination, being too simplistic and ignoring known chemical or radionuclide contaminants, the model still shows incredibly disturbing spread of radionuclide contamination at levels 100 times the Drinking Water Standard from the Central Plateau to the Columbia River over the coming decades. The model also shows the contamination around the 300 Area at levels from ten to 100 times the Drinking Water Standard spreading for decades along the River before shrinking under USDOE's "natural attenuation" plan.



Hanford's Annual Groundwater Monitoring Report for 2000 reported that the highest concentration of the radioactive contaminant Strontium 90 was 1,837 times the federal Drinking Water Standard (DWS) in shoreline seeps in the Hanford 100-N Area (near the N-Reactor, which used half mile long trenches alongside the River for dumping its untreated, highly contaminated cooling water).<sup>3</sup> The federal Drinking Water Standard is set for most carcinogens, including radionuclides, at the level that would cause one additional fatal cancer for every ten thousand adults drinking the water (referred to as a risk of 1E-4, in scientific notation). USDOE is currently proposing to halt excavation of the "cribs" (trenches) at fifteen feet, because it says it is not practical to remove the high levels of contamination below that level. However, those contaminated soils will continue to spread contamination into the River, even if exposure at the surface is within acceptable limits, after clean soil is placed on top. Exposure will not meet those health based standards for unrestricted future site use, however, because the reasonably foreseeable future use of irrigation or sprinkler water use would drive contamination to groundwater, and the crops would be contaminated from use of groundwater.

Chromium VI is a toxic and carcinogenic form of chromium that contaminates groundwater in several of the 100 Areas. Chromium contamination levels in 2001 were reported as high as 5 times the Drinking Water Standard in shoreline seeps and 475 times as high as the standard in near shore wells in the 100 D Reactor Area. Levels of chromium in the 100 K Area were as high as 13 times the standard.<sup>4</sup> Chromium is particularly toxic to, and has serious impacts on development of, developing salmon fry. Chromium impacts the development and health of the salmon at much lower levels than the federal Drinking Water Standard. The salmon "redds", the area where the salmon eggs are laid in gravelly, shallow pools, are also where Hanford's contaminated groundwater either upwells into the River or where shoreline seeps feed the pools. Hanford officials frequently point to the great volume of water in the river as diluting the contamination and keeping levels of contaminants at very low levels. However, it is where the salmon eggs are laid and the young fry develop that the contamination is highest. Further, the Hanford Reach is subject to wide variations in water levels, particularly from the release or

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<sup>3</sup> Hanford Site Groundwater Monitoring Report for Fiscal Year 2000; Table 2.1-1 at 2.9. The Drinking Water Standard for Strontium90 is 8 pCi/L (picoCuries per Liter). Strontium 90 was measured in the seeps at 14,700 pCi/L. Levels in the near-shore wells were even higher at 17,700 pCi/L. In 2001, the shoreline and well contamination levels reported were both 9690 pCi/L. Hanford Site Groundwater Monitoring Report for Fiscal Year 2001; Table 2.1-3 at 2.11. No explanation appears to be given for the exact same result reported in the shoreline seeps, leading us to assume that the FY 2001 data was actually the same sample as the well. No sampling for Sr90 occurs in the 300 Area at all. Id.

<sup>4</sup> Levels were 4,750 ug/L in D wells and 521 ug/L in shoreline seeps. The Drinking Water Standard for Chromium (vi) is 100 ug/L.

holding of water in upstream dams. The pools where the salmon eggs are laid and the fry develop are likely to be maintained by springs and seeps of highly contaminated groundwater – thus, those salmon that are not left dry at the River's edge, are those that are likely to be impacted most from Hanford's contaminated groundwater.

### A Conflict in Visions:

The public and citizen groups have a vision with specific goals for cleanup of the Columbia River Corridor to allow for safe use by the public, and the exercise of Treaty rights by the Tribes, by 2011. *To achieve this goal, the groundwater must be remediated as well as the soil.*

What is a "strategy" and how do we define "goals"?

Even as to the basic definition of strategy and goals, there are fundamental conflicts between the public vision and expectation, and the USDOE's use of these same terms.

Goals are achievable outcomes that can be measured and have a completion date. The public expects that the agencies will be able to tell the public when "goals" have been met, and to measure progress towards those goals.

A Strategy is the specific means to achieve measurable goals by a certain date.

Compare these expectations, based on broadly accepted strategic planning principles, with the agencies' description of the Groundwater Strategy's "goals".

USDOE's Groundwater Strategy claims that it has "Goals" to:

- "Focus on reduction of risk – tailor characterization, monitoring, and other activities to risk reduction
- Minimize further spread of contamination
- Minimize further degradation of groundwater during remedial and closure activities
- An integrated groundwater program common to all regulatory programs"

From "Hanford Site Groundwater Strategy – Protection, Monitoring, and Remediation" PowerPoint presentation to the Hanford Advisory Board, December, 2002.

These are NOT "goals". They are not measurable. There is no timeline. The public will never know if they are, indeed, accomplished. They are, in fact, strategies for reaching a set of totally undefined goals. If the agencies were to adopt goals, for example, of cleaning up groundwater to allow unrestricted public and Tribal use of the Hanford Reach by 2012, or a goal of having fully compliant groundwater monitoring at all soil units by 2006, then these might be a portion of an appropriate set of strategies towards reaching those goals.

### **Response:**

**The Tri-parties have set measurable goals in order to reduce risk, prevent further spread of contamination and remediate groundwater through various interim groundwater Records of Decision (RODs). At present, the pump and treat remediation activity (at the rate of about 550 gallons per minute across the site) is underway to reduce the risk and spread of contamination for contaminants such as technetium, carbon tetrachloride, uranium, strontium and chromium. The results of these activities are regularly monitored to make sure that the remediation methods used are effective and meet the ROD objectives.**

**Monitoring has shown that at several places, current active remediation will achieve ROD the ROD objectives (e.g. reduction of the chromium concentration and plume size in H Reactor Area, and technetium-99 in the 200 West Area). EPA's 5 year ROD review is aimed at determining the effectiveness of these activities and providing a detailed path forward towards achieving the objectives. The strategy sets overall objectives for protection, monitoring and remediation.**

It is possible to ascertain widely held public "values" on which goals should be based for cleanup of Hanford's groundwater.

First and foremost is the goal for cleanup of groundwater at all contaminated hazardous waste sites established in the Washington State law governing the cleanup of hazardous waste sites, which was adopted by Washington's voters, the Model Toxics Control Act, RCW Chapter 70.105D.

This law clearly sets a measurable goal for cleanup of groundwater to allow for all groundwater to have "beneficial use" as drinking water. Thus, NO groundwater is allowed under the statute to be written off and sacrificed to contamination without attempting to meet this goal. Cleanup levels (for soil and groundwater) are required to be established to attempt to meet the goal of beneficial use for drinking water purposes. If the reasonably foreseeable maximum public exposure is from a beneficial use that results in greater risk or exposure than from drinking, then the cleanup levels are required to be established to attempt to meet the goal of that greater beneficial use:

WAC 173-340-720 (a)

Groundwater cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions. The department has determined that at most sites use of ground water as a source of drinking water is the beneficial use requiring the highest quality of groundwater ... Unless a site qualifies under subsection (2) of this section for a different ground water beneficial use, ground water cleanup levels shall be established in accordance with subsection (3), (4) or (5) of this section.

(b) In the event of a release of a hazardous substance at a site, a cleanup action complying with this chapter shall be conducted to address all areas where the concentration of the hazardous substance in the ground water exceeds cleanup levels.

(c) Ground water cleanup levels shall be established at concentrations that do not directly or indirectly cause violations of surface water, sediments, soil or air cleanup standards...

(d) The department may require more stringent cleanup levels than specified in this section where necessary to protect other beneficial uses or otherwise protect human health and the environment.

(2) Ground water shall be classified as potable to protect drinking water beneficial uses unless the following can be demonstrated:...(b) The ground water is not a potential future source of drinking water..."

*Thus, the public vision and goal for safe, unrestricted use of the Hanford Reach of the Columbia River by 2012 is supported by a goal established in state law that requires cleanup actions to restore the groundwater to unrestricted use – especially in an area that has been*



designated as a National Monument and has foreseeable increasing public and Tribal usage, and unique, protected resource values.

Incredibly, Washington's Model Toxics Control Act, and its regulations, are not even referenced or cited as a relevant standard in the Draft Groundwater Strategy.

The public expects that the Groundwater Strategy will attempt to meet the "goal" clearly established in State law. Rather than doing so, the Draft Groundwater Strategy is based on sacrificing the State's groundwater and not attempting to meet this vital goal.

The Mission Statement for the Hanford Groundwater Strategy and Goals need to be changed to reflect the legally applicable standard from the Model Toxics Control Act, and public values:

The mission of the Hanford Groundwater Protection Program is to restore groundwater to beneficial use, which is not restricted by contamination, and to cleanup groundwater so that health risk and environmental standards are met or exceeded. The strategy to achieve this will be the conduct of remedial actions to meet cleanup levels that are protective of human health and the environment, pursuant to relevant standards from the Model Toxics Control Act, federal Superfund and Clean Water Acts, and other applicable or relevant standards.

The mission of the Hanford Groundwater Protection Program is also to protect the Columbia River from contaminated groundwater from past, present and future operations at the Hanford Site. The strategy to meet this goal is to remediate and restore groundwater to meet relevant standards, through the conduct of cleanup actions and development of technologies, where necessary to meet this goal.

**Response:**

**The Tri-parties agree with the goal that groundwater should be restored to its highest beneficial use. Footnote 1, which appears at the end of the first sentence in the Strategy Mission so states. We believe our intent is consistent with your recommendation. No change to the text is required.**

The current draft Groundwater Strategy not only fails to adopt a goal that meets the requirements of the Model Toxics Control Act, it also selects weaker goals and adopts strategies that conflict with the legal mandate for active remediation:

The draft Mission Statement cites only the CERCLA (federal Superfund) standard that "EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site."<sup>5</sup>

Washington State voters rejected the "practicality" standard of the federal Superfund, and applied a more stringent test for when groundwater and cleanup standards may be determined to be infeasible to be met. Of course, the practicality standard is a subjective one. At the Hanford Site, USDOE says that remediation is not practical, while spending just 10% of the entire Site Budget on Environmental Restoration, and a miniscule amount on groundwater remediation – while spending hundreds of millions annually on contractor overhead, "planning", importing additional wastes, (and until this year, \$40+ million a year wasted keeping the FFTF Reactor on hot standby). *Bizarrely, this so-called "Groundwater Strategy" fails to make a single commitment to funding for remediation, installation of legally required groundwater monitoring wells, increasing well monitoring, characterization of the vadose zone and early detection of contaminants heading towards groundwater.*

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<sup>5</sup> Draft Groundwater Strategy at Page 1. Sec. 1 "Mission", footnote citing 40 CFR 300.430(a)(1)(iii)(F).

**Response:**

**The first objective of the strategy is the “satisfy regulatory requirements” which would include legal requirements for groundwater monitoring wells, well monitoring and characterization and remediation.**

**The Groundwater Protection Program is spending approximately \$70 million a year on groundwater protection, monitoring and remediation.**

**Conflict in Vision and Goals:  
Time to Eliminate Use of USDOE’s  
“Derived Concentration Guides”**

An example of this conflict between the public’s vision and goals and USDOE’s is shown in USDOE’s continued use of “Derived Concentration Guides” (DCGs). For each contaminant, USDOE has established its own ‘standard’, called a Derived Concentration Guide, for how much contamination can be present in the groundwater on site. These DCGs are set at levels between 15 and 500 times the federal Drinking Water Standard.<sup>6</sup> For years, USDOE claimed that it “owned” the groundwater beneath the Hanford site, and could contaminate it as it saw fit. However, well established federal law based on the Constitution recognizes that the States were given ownership of the groundwater, and that the groundwater beneath Hanford is a resource of the State of Washington.

The Derived Concentration Guide (DCG) is set by USDOE at Hanford based on the principle that these levels of contamination in the groundwater are acceptable, despite being magnitudes higher than the federal Drinking Water Standards, or Maximum Concentration Limits set under federal and State laws. USDOE based these DCGs on a model predicting that these levels would decrease to the MCL or DWS by the time that the groundwater flowed to the River. Putting aside the clear failure of those models, use of the DCG clearly violates all values and legal standards for preventing contamination above Drinking Water Standards. *The use of Derived Concentration Guide levels is in total conflict with the standard cited in Washington State law<sup>7</sup> that all groundwater shall be assumed to be usable for drinking water and restored for that purpose.*

*A legally compliant Groundwater Strategy would forever abandon the use of USDOE’s Derived Concentration Guide values.*

**Response:**

**The Strategy does not consider nor refer to the Derived Concentration Guide. The question of whether the Derived Concentration Guide should be “abandoned” is beyond the scope of this strategy, which is an overarching framework document.**

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<sup>6</sup> For example: The DWS for Cesium 137 is 200 pCi/L, while the DCG established by USDOE is 3,000. The DWS for Cobalt 60 is 100 pCi/L, while the USDOE DCG is set at 5,000. Strontium 90 DWS = 8, DCG = 1,000. SEE Hanford Site Annual Groundwater Monitoring Reports Tables 2.1-3 for FY 2001, and 2.1-1 for FY 2000.

<sup>7</sup> WAC 173-340-720

**Conflict With Public Vision and Goals to Clean-Up the  
Columbia River Corridor to Allow for Safe, Unrestricted Public and  
Tribal Use by 2011:**

In 2000, USDOE Hanford managers produced a new plan for Hanford cleanup, in which they adopted a goal to clean up the River corridor by 2012, and release it for public use. (Hanford 2012 Plan). This Plan did not meet the previous promised goal of cleaning up the River Corridor by 2011. However, a delay in meeting a Hanford Clean-Up goal by one year would have been cause for disappointment, but it would not have caused the outcry that his plan caused. The 2012 Plan continued to base cleanup of the 300 Area and a swath of land outside the 300 Area along the River on an “industrial cleanup standard” for the contaminated soil. This weaker standard would only clean up the soil to a level that will be “safe” for an adult worker to be exposed in the affected area based on a 2000 hour work year, with much of their time indoors, and with NO general public access, NO recreation, NO Tribal use of cultural and ecological resources, NO Treaty use of the River shore, and NO children. And, there would be NO cleanup of the groundwater for the 300 Area and the areas surrounding it. USDOE referred to its groundwater strategy as “natural attenuation.”<sup>8</sup>

Use of the “industrial cleanup standard”, instead of the unrestricted use cleanup standard, is forbidden by the Model Toxics Control Act and its implementing regulations where, as in and around the 300 Areas, groundwater transports contaminants offsite to the River shoreline or River:

Washington Administrative Code 173-340-745 (1)(a)(iii) “Hazardous substances remaining at the property after remedial action would not pose a threat to human health or the environment at the site or in adjacent

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<sup>8</sup> Heart of America NW has commented extensively on the illegal use of the industrial cleanup standard for the Hanford 300 Area, and incorporates those comments herein. SEE comments on 300-FF2 Cleanup Plan (RIFS), 2002; and, Comments on 100 and 300 Areas TPA Changes, 2002. Washington’s Model Toxics Control Act (RCW 70.105D and regulations) requires that all hazardous waste sites be cleaned up to meet the unrestricted future public use standard, which is based on no residual contamination precluding safe use by children or other reasonably foreseeable exposed portions of the public. The cancer risk from all sources of contamination remaining at the site after cleanup can not exceed one additional cancer in one hundred thousand persons exposed under this standard. The industrial use standard is limited by law to areas that were traditionally used for industry, are zoned and expected to continue to be used exclusively for industrial use (as shown by fencing, pavement, and restrictions that preclude general public or commercial use), and where the contamination will not spread to adjacent non-industrial areas or any surface water body. The 300 Area and the areas outside it that USDOE is limiting cleanup to an industrial standard are contaminating the Columbia River with Uranium and other contamination. Furthermore, it is clear that the lands outside the fence of the 300 area are already used for recreation, and are not even likely to be industrial. In fact, to limit their use to industry would conflict with the Executive Order designating the Hanford Reach National Monument and with the established Native American Nations’ Treaty Rights, likely requiring compensation as well as natural resource damages under CERCLA.

nonindustrial areas. In evaluating compliance with this criterion, at a minimum the following factors shall be considered:

(C) The potential for transport of residual hazardous substances to off-property areas,...;  
(D) The potential for significant adverse effects on wildlife caused by residual hazardous substances...

(1)(c) Industrial soil cleanup levels shall be established at levels that do not directly or indirectly cause violations of ground water, surface water, sediment, or air cleanup standards established under this chapter or under applicable state and federal laws.

WAC 173-340-720 (a)

Groundwater cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions. The department has determined that at most sites use of ground water as a source of drinking water is the beneficial use requiring the highest quality of groundwater ... Unless a site qualifies under subsection (2) of this section for a different ground water beneficial use, ground water cleanup levels shall be established in accordance with subsection (3), (4) or (5) of this section.

(b) In the event of a release of a hazardous substance at as site, a cleanup action complying with this chapter shall be conducted to address all areas where the concentration of the hazardous substance in the ground water exceeds cleanup levels.

(c) Ground water cleanup levels shall be established at concentrations that do not directly or indirectly cause violations of surface water, sediments, soil or air cleanup standards...

(d) The department may require more stringent cleanup levels than specified in this section where necessary to protect other beneficial uses or otherwise protect human health and the environment.

(2) Ground water shall be classified as potable to protect drinking water beneficial uses unless the following can be demonstrated:... (b) The ground water is not a potential future source of drinking water..."

USDOE's subsequent plans (Review of February 2002 and Hanford Performance Management Plan and this current Groundwater Strategy) all continue to follow this strategy of not cleaning up the 300 Area groundwater, and not meeting unrestricted future use goals for the Southern Gateway to the Hanford Reach.

**Response:**

**As stated in the Strategy it is the goal to return groundwater to its highest beneficial use. Regarding the 300 area soil cleanup the approach toward assessing and factoring land use assumptions into the remedial actions for the 300 Area are consistent with USEPA's "Land Use in the CERCLA Remedy Selection Process" policy (OSWER Directive No. 9355.7-04) and MTCA, RCW 70.105D.020(23) and WAC 173-340-745(1). USEPA's directive states that "remedial action objectives developed during the RI/FS should reflect the reasonably anticipated future land use or uses." The Tri-Parties' cleanup approach for the 300 Area has been consistent with this policy. The reasonably anticipated land use of "industrial" for the 300 Area Industrial Complex, the areas adjacent to the 300 Area Industrial Complex to the north and west, and the outlying sites/burial grounds 5-8 miles**

north of the 300 Area Industrial Complex are consistent with the relevant land use planning documents. These are:

- The Final Report of the Hanford Future Site Uses Working Group (December 1992) described the cleanup objective for the 300 Area (both the industrial complex and surrounding vicinity) as “restricted status for industrial use” under both “Cleanup Scenario A: Cleanup for Economic Development, Wildlife” and “Cleanup Scenario B: Cleanup for Agriculture and Native American Uses Outside the 300 Area,” as explained in the report.
- The Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (September 1999) includes all sites in the 300-FF-1 and 300-FF-2 Operable Units (including outlying sites and burial grounds) in an “industrial” land use designation to support “new DOE missions or economic development.”
- The City of Richland’s Comprehensive Land Use Plan identifies the 300 Area (as well as areas North and South of the 300 Area) as an “Urban Growth Area” pursuant to Washington’s Growth Management Act. Land uses identified in the plan include “industrial” and “business/research park.”
- Benton County’s Draft Hanford Land Use Plan (Spring 2000) identifies all sites in the 300-FF-1 and 300-FF-2 Operable Units (including outlying sites and burial grounds) as either being in the City of Richland’s “Urban Growth Area” or in a land use zone defined by Benton County as “industrial & heavy.” Within the Urban Growth Area, the County defers land use planning and land use designations to the City of Richland, unless there is a marked disagreement. In this case there is not. The Draft Hanford Land Use Plan is to be incorporated into the Benton County Comprehensive Plan as Chapter 13 when the plan is updated.

While none of these documents can formally zone the 300 Area NPL site as “industrial,” the plans document what a working group comprised of Hanford stakeholders, DOE, and local land use planning authorities expect in the way of future land use and are sufficient for the Tri-Parties to conclude that “industrial” or “general urban uses other than residential,” are reasonably anticipated future land uses for the areas covered by the 300 Area CERCLA decision documents. This means that institutional controls must be a required part of the remedy in order to ensure that land uses are limited to those defined in the 300 Area industrial use exposure scenario. Any changes to the land use that are inconsistent with the land use assumptions upon which the RODs are based will be evaluated as part of the CERCLA five-year review.

It should be noted that future reuse of the 300 Area is not restricted to industrial use only, but rather to uses that are consistent with the exposure assumptions of the 300

**Area industrial exposure scenario assuming institutional controls are maintained. This could permit other commercial uses as well. In addition, it should be noted that the entire 300 Area NPL site is not contaminated, and those areas that were never contaminated would support other uses (e.g., bike trails) assuming institutional controls are in place for adjacent areas that may contain residual hazards.**

**Therefore, the reasonably anticipated future land use is industrial pursuant to EPA policy and guidance and it is appropriate to use industrial cleanup standards for the 300 Area cleanup process.**

**A Public Interest Blueprint to Reach the**  
**Goal of Safe, Unrestricted Public Use of the Hanford Reach:**

In 2002<sup>9</sup>, Heart of America Northwest proposed a new blueprint and strategy to reach the goal of unrestricted public use of the Hanford Reach by 2012:

**The onset of remedial action for groundwater in each area of the River Corridor** (i.e., 100-B; 100-N; 300 Area) **should be included in the TPA at this time**, with a **start date of one year after completion of the proposed soil remedial action for that area**. This provides ample time for monitoring and assessment, and would show an effort to be consistent with requirements of CERCLA, RCRA and MTCA for the onset of characterization and remediation of units.

**We urge the agencies to join with us in moving towards a vision of a safe, publicly usable Hanford Reach National Monument by 2011.** The Treaties of 1855 guarantee Native Americans the right to fish and, live along, the River Corridor. Once the areas are no longer required for Atomic Energy Defense purposes, additional rights to utilize the lands for food and cultural purposes will be in full effect. The federal agencies have a

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<sup>9</sup> “Proposed Agreement on Tri-Party Agreement Schedules for Clean Up of Waste Sites and Facilities Along the Columbia River”; Comments of Heart of America Northwest, and Heart of America Northwest Research Center (Columbia River Corridor 100 and 300 Area Tri-Party Agreement Change Package) March, 2002.

fiduciary duty to protect and accommodate these rights. Failing to cleanup groundwater - preventing unrestricted access to the River shorelines (including areas of contaminated discharges that are not owned by the United States, but, rather by the State of Washington) - violates that fiduciary duty and those rights.

Failing to include an enforceable schedule for remediation of groundwater, with requirements for technology development and demonstrations for certain contaminants, makes claims that there will be unrestricted access to the Hanford Reach National Monument and “delisting” of the area, a sham.

Only by including milestones for the start and completion of groundwater remedies, will this TPA package not appear to be a cruel hoax when it is discussed as accelerating cleanup along the River Corridor leading to unrestricted public access by 2012.

This proposal was strongly supported by scores of public commentators at annual State of the Site meetings, Hanford Clean-Up Priorities hearings and in comments on the TPA changes; and, by numerous other citizen groups.

The strong support for this blueprint exists because it is a real “strategy” to achieve the vision of safe, unrestricted use of the Columbia River, with realistic goals.

The Hanford Advisory Board endorsed this strategy and blueprint in February of 2002, while criticizing the lack of milestones to start groundwater cleanup along the River Corridor after 2013, and on a timeline that could never meet the TPA milestone for completion of cleanup of soil and groundwater by 2018 (with exception for the Central Plateau tank farms):

“While the Board supports the development of enforceable milestones aimed at river corridor cleanup, this support is tempered by the following concerns and recommendations:

#### Groundwater

“Groundwater remains of foremost concern to the Board. The Board encourages the agencies to maintain ongoing successful groundwater remediation actions and pursue more aggressive technology development and treatment activities.

“Currently the change package would establish milestones that require initiation of groundwater restoration activities only after all 100 Area soil removal actions are complete. The Board recommends that actions be expedited by initiating groundwater actions in each remedial unit upon completion of soil removal in that unit.”<sup>10</sup>

The USDOE “Hanford Site Groundwater Strategy” has no vision of unrestricted use of the Columbia River, nor any “strategy” or goals for achieving cleanup (remediation) of groundwater.

The contrast could not be more clear between the public’s vision and the proposal to call the document out for review a “Strategy”, when it has NO Goals for when groundwater will be cleaned up, when the Hanford Reach will be safely usable without exposure to groundwater contamination pathways during unrestricted future use, and no blueprint or strategy for cleaning up groundwater in the Columbia River Corridor. We urge the Tri-Party Agreement agencies to adopt a specific vision and blueprint for cleanup of contaminated groundwater in the Columbia River corridor, as called for by the public and the Hanford Advisory Board.

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<sup>10</sup> Hanford Advisory Board Consensus Advice #125: “100/300 Area TPA Change Package”; February, 2002.

**Response:**

The goal of the strategy is to cleanup groundwater to its highest beneficial use and to protect the Columbia River from contaminated groundwater. Specific actions and goals are provided in the implementation document “Hanford Groundwater Management Plan: Accelerated Cleanup and Protection, DOE/RL-2002-68. March 2003. This document is now available. You can access it on the FH Groundwater Protection Program Web site (<http://www.hanford.gov/cp/gpp/>). CDs and hard copies will be available soon.

**The USDOE Groundwater Strategy Fails to Live Up to the  
Claimed Commitment to Prevent Additional Harm; and, Has  
NO Strategy and Schedule for Bringing the Groundwater Monitoring at Burial Grounds  
Into Compliance With RCRA and State Standards:**

**Burial Grounds:**

Any strategy that claims it will prevent additional harm to groundwater must start with ending dumping of radioactive wastes in unlined soil trenches.

Incredibly, USDOE fails to make a commitment to end the dumping of radioactive wastes in unlined trenches in this Strategy, and fails to make ending of dumping in unlined trenches a Preferred Alternative in the Revised Draft Hanford Solid Waste EIS (RD-HSWEIS, April, 2003). In fact, not one alternative in the RD-HSWEIS would end dumping of waste in unlined trenches in the near future, and all alternatives would continue to use unlined trenches for several years. Three of the six alternatives would use unlined trenches forever.

Washington State law forbade expansion of landfills or creation of new trenches without liners and leachate collection systems after 1992. Yet, as explained below, USDOE has repeatedly expanded and added massive new trenches without liners or leachate collection – some longer than three football fields. Three of six alternatives in the RD-HSWEIS would illegally expand the Low-Level Burial Grounds without liners and leachate collection systems. USDOE does not even note that this is illegal or note any conflict with the claimed goals of its “Groundwater Strategy”. Seven million cubic feet of the new capacity would be solely for offsite radioactive wastes, which clearly shows that the Hanford soil and groundwater are being sacrificed, rather than cleaned up.

Any “Groundwater Strategy” that is not violated by the illegal massive expansion of new unlined soil trench burial grounds is not worth the dirt it is written with.

While USDOE proposes to add massive new burial ground capacity, the Groundwater Strategy and the RD-HSWEIS fail to have any schedule or goal to bring the Low-Level Burial Grounds into compliance with groundwater monitoring standards.

Ironically, the Draft Groundwater Strategy at Sec. 5.1.1 says that operation of waste storage and disposal facilities “must reflect basic minimum technology (double liner, leachate collection, etc.) and groundwater monitoring requirements of RCRA.” The section cites WAC 173-303-645 requirements for groundwater monitoring as applicable to all waste disposal units. This statement of the law, however, is not followed through with any schedule or commitment to meet the cited standard, and NO GOAL is set for achieving compliance.



There is a massive compliance deficit for groundwater monitoring at the Low-Level Burial Grounds (these five large areas are spread across the 200 East and West Areas).

Most of the groundwater monitoring wells around the Low-Level Burial Grounds have either gone dry, or are going dry (as the water table dropped, wells no longer reached the water. The number of wells was never adequate, and became more inadequate as the water table dropped and the direction of groundwater movement changed).

Ecology issued an extensive Notice of Deficiency for USDOE's RCRA permit (Part B) application for these burial grounds, in January 2003. Yet, the Groundwater Strategy fails to mention the issues by Ecology for the LLBG Part B Permit Application which included groundwater monitoring program deficiencies. The number of wells that are required around the Low-Level Burial Grounds, as cited in Ecology's Notice of Deficiency analyses based on statistical sampling requirements, is over 100.

USDOE only proposes to install 3 RCRA groundwater wells in FY 2004 for DOE-Richland, and 6 for the Office of River Protection (at the High-Level Waste Tanks farms). In 2005, this is supposed to increase to 14 wells. Again, these will not all be at the LLBGs, or few will be. USDOE cites the cost (at \$200,000 to \$250,000 per new RCRA well) as the reason for not setting more aggressive goals to come into compliance with groundwater monitoring requirements. Yet, USDOE will spend \$43 million on "Planning and Integration" in FY 2003, while refusing to detail how it spends funds across the board, and refuses to disclose the level of funding for Hanford contractors' overhead accounts (which exceeded \$300 million for FY 2000). That "Planning and Integration" funding would pay for over 160 new groundwater monitoring wells to be installed.

A real Groundwater Strategy would:

- set enforceable goals for achieving compliance with groundwater monitoring requirements
  - that should be no later than 1/1/2006 for the Low-Level Burial Grounds
- adopt an enforceable schedule for initiation and completion of a full investigation of all releases of hazardous substances from the Low-Level Burial Grounds, beginning within 90 days.
  - Further groundwater protection and remediation actions would be determined by the results of an investigation of all potential releases in all burial grounds (i.e., all likely solvents co-disposed with the TRU wastes that are releasing Carbon-Tetrachloride to the vapor space in the LLWMA4 burial grounds at levels that are nearly twice those that are fatal to humans [measured at 1,760 ppm]), including evidence that the organic chemicals have reached groundwater already.
- Adopt an enforceable deadline, by the end of this year, to end USDOE's dumping of wastes in unlined burial grounds without leachate collection.
  - Not allow USDOE to issue a Revised Draft Hanford Solid Waste EIS that has all alternatives continuing to use unlined burial grounds for low-level Waste for, at least, several years; and, half of whose alternatives would never eliminate use of unlined burial grounds.
- Require use of an accurate inventory of the chemical, as well as radioactive, wastes in the burial grounds for use in models predicting the degree of groundwater contamination and cumulative impacts from additional disposal.
- Require consideration of impacts to groundwater at the edge of burial grounds and other disposal site units, as the legally applicable point of compliance. Bar USDOE from only

analyzing groundwater contamination impacts at a kilometer away from the boundary, as it does in the Revise Draft HSWEIS. Require USDOE to also analyze and consider the maximum concentration in groundwater under the unit.

- Recognize in the Groundwater Strategy and RDHSWEIS that RCRA closure, post closure monitoring and corrective action requirements apply to the entire Low-Level Burial Grounds.
  - USDOE has repeatedly stated that it believes it had interim status for these Low-Level Burial grounds and submitted a Part B application for the entire areas.
  - The Groundwater Strategy and USDOE's Groundwater Plan now attempt to evade RCRA requirements by claiming that only isolated islands in the burial grounds have Mixed Waste and only those islands are subject to RCRA and the State Hazardous Waste Management Act. Yet, it has been repeatedly documented that USDOE did not meet waste characterization, designation and segregation requirements, which led to repeated illegal disposal of Mixed Wastes in the unlined burial grounds. Absent full characterization and records that are adequate to meet rCRA requirements, all waste in the burial grounds must be managed as if it is suspect Mixed Waste. In any event, the entire burial grounds are subject to RCRA and HSWMA requirements because of these documented problems.

#### **Response:**

**The focus of this section of text is on unit-specific issues which are beyond the scope of an overarching framework document such as the groundwater strategy. Unit specific recommendations for facilities such as the Low Level Burial Grounds (LLBG) will be made in other regulatory documents such as permits and Records of Decisions. Each of these regulatory tools has requirements for public comment processes that will allow you to evaluate specific requirements and make comments to the Tri-parties prior to final decision making. The LLBG permit is currently in the Notice of Deficiency stage. Specific groundwater requirements will be included in the draft permit conditions.**

Some of these unlined burial ground trenches are immense. In 1997, USDOE expanded a trench that is 1,160 feet long – without seeking a permit and without attempting compliance with either RCRA or RCW Chapter 70.105 – with a capacity for USDOE to dump 700,000 cubic feet of waste.<sup>11</sup> In 1999, USDOE again approved another massive trench expansion for a 900 foot long trench, in order to increase capacity for bulk disposal of LLW in the trench to 223,000 cubic feet.<sup>12</sup> In recent years, disposal of waste in the unlined trenches has ranged from 200,000 cubic feet to 600,000 cubic feet.

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<sup>11</sup> 1997 EA, Expansion of Trench 33 in the W-5 Burial Ground, May, 1997; USDOE; Section 2.1.

<sup>12</sup> EA for proposed expansion of Trench 36 Within the 218-E-12B Low-Level Burial Ground;

## The Strategy Must Acknowledge Releases of Hazardous Substances from, and Violation of Non-Discretionary Duties For Operation of, the Burial Grounds as Interim Status Facilities Under RCRA:

The burial grounds are alleged by USDOE officials to have interim status under RCRA, 42 USC 6925. USDOE and its contractors applied for a Part B permit for these unlined burial grounds a decade ago – without providing characterization data; without identifying the nature, sources, and quantities of wastes; without providing a closure plan; without characterizing releases; without meeting groundwater and vadose zone monitoring requirements; and, without even updating the SEPA threshold analyses. It is clear that no permit could be issued without an environmental impact statement, yet the USDOE and contractor have failed to perform an adequate EIS for the processing of a permit.

USDOE has willfully operated and expanded the unlined Low-Level Burial Grounds in violation of the provisions of RCRA and Washington's Hazardous Waste Management Act, Chapter 70.105 RCW. These expansions have illegally occurred without a permit.<sup>13</sup>

Some of these unlined burial ground trenches are immense. The expansion approved in 1997 by USDOE – without seeking a permit and without attempting compliance with either RCRA or RCW Chapter 70.105 – was for a 1,160 foot long trench, with a capacity for USDOE to dump 700,000 cubic feet of waste.<sup>14</sup> In 1999, USDOE again approved another massive trench expansion for a 900 foot long trench, in order to increase capacity for bulk disposal of LLW in the trench to 223,000 cubic feet.<sup>15</sup>

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USDOE, 1999. See Table 1 regarding forecast for FY 1999 Waste Disposal. *DOE/EA-12*

<sup>13</sup> In 1997, for example, USDOE expanded and began to operate disposal Trench 33 within the 218-W-5 Burial Ground in the 200 West Area. The base of this trench was widened to 20.4 meters (67 feet) for the entire 354 meter (1160 foot) length of the trench. USDOE documents (EA, 1997) stated: "Existing capacity would be expanded from approximately 12,000 cubic meters (428,000 cubic feet) to 20,300 cubic meters (717,000 cubic feet)." In 2000, USDOE stated that it was again running out of disposal space in the unlined burial grounds, and proposed another expansion, this one for the W-4 burial grounds. Another EA was issued, but the action was not taken pending the issuance of the Hanford SWEIS. However, there are questions as to whether new trenches were placed in operation and / or expanded since 1997. In 1999, USDOE proposed to expand Trench 36 within the 218-E-12B Low-Level Burial Ground for disposal of LLW. The EA described the proposed action to widen the base of this trench from approximately 1.5 meters (5 feet) to 9.1 meters (30 feet) along the entire 275 meter (900 foot) length of the trench. "Existing bulk LLW disposal capacity in Trench 36 would increase almost six times from approximately 1,050 cubic meters (37,200 cubic feet) to 6,320 cubic meters (223,000 cubic feet)." The forecast for FY 1999 waste disposal for which this action was predicated showed a forecast of approximately 100,000 cubic feet of bulk LLW disposal, with 45% from offsite generators. EA for proposed expansion of Trench 36 Within the 218-E-12B Low-Level Burial Ground; USDOE, 1999. See Table 1 regarding forecast for FY 1999 Waste Disposal.

<sup>14</sup> 1997 EA, Expansion of Trench 33 in the W-5 Burial Ground, May, 1997; USDOE; Section 2.1.

<sup>15</sup> EA for proposed expansion of Trench 36 Within the 218-E-12B Low-Level Burial Ground; USDOE, 1999. See Table 1 regarding forecast for FY 1999 Waste Disposal. *DOE/EA-12*

42 USSC 6925(i) requires that interim status facility landfills receiving hazardous waste after July 26, 1982 must meet the standards for ground water monitoring, unsaturated zone monitoring and corrective action, which are applicable to new landfills.

Two of Hanford's active burial ground areas were opened for service after 1982.<sup>16</sup> Neither one has liners and leachate collection, nor does either one meet standards for groundwater monitoring and unsaturated zone monitoring. Indeed, a massive trench expansion in one of these burial grounds occurred in 1997 in the 218-W-5 Burial Ground, adding nearly 300,000 cubic feet of capacity for disposal in Trench 33. No effort was made to comply with these requirements of RCRA, no effort was made to obtain a permit for the expansion.<sup>17</sup>

It is undisputed that USDOE has placed hazardous wastes, including Mixed Waste, in the unlined burial grounds since 1982. Indeed, it continues to place Mixed Wastes, or wastes which are suspected of being Mixed Wastes and which are not fully characterized, in these burial grounds, and other unpermitted facilities.<sup>18</sup>

Washington State has given USDOE repeated notice of the violation of groundwater monitoring requirements for the Low-Level Burial Grounds. USDOE documents note that the groundwater monitoring fails to meet applicable legal requirements, and that there is no vadose zone or unsaturated zone monitoring. Further, USDOE documents reveal that more groundwater monitoring wells around the LLBG are going dry, further exacerbating the harm and degree of violation.<sup>19</sup>

USDOE's Hanford Low-Level Burial Grounds do not qualify for interim status. Interim status terminated, if it was ever grantable, no later than 1992, when USDOE failed to apply for final facility permits for land disposal facilities by November 1988. Even if USDOE had met that deadline, the status would have terminated, and the Administrator and Director have mandatory duties to deny any permit application for the burial grounds.<sup>20</sup> To continue in interim status required certification that the land disposal facility is in compliance with all applicable

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<sup>16</sup> Burial Ground 218-W-3AE "Service Date" was 1983, and the 218-W-5 Burial Ground start of Service date was 1986. Source: USDOE "Low-Level Burial Grounds Fact Sheet" ; REG-0271; 1/02. Available on line as of January, 2003.

<sup>17</sup> 1997 EA, Expansion of Trench 33 in the W-5 Burial Ground, May, 1997; USDOE. In the EA, the provisions of RCRA and Washington's Hazardous Waste Management Act were not even mentioned, even in the section for required permits and regulatory approvals.

<sup>18</sup> E.g.: See Notice of Violation for disposal of hazardous wastes from Lawrence Berkeley National Lab, 1995 and 1996. Also see "Acceptable Knowledge" packages for Remote-Handled and Contact-Handled Transuranic wastes shipped to Hanford, December 2002, from ETEC and Battelle Columbus Lab. These documents show that wastes being placed in the LLBG Waste Management Area 4 for indefinite "storage" contain hazardous wastes, have RCRA Waste Codes, and include numerous potential uncharacterized hazardous wastes under RCRA and Washington State definitions. The documents also reveal that large quantities of TRU with suspect Mixed Wastes were disposed of at Hanford's LLBG since 1982.

<sup>19</sup> SEE Hanford Site Groundwater Monitoring Reports for Fiscal Years 1999, 2000, 2001. See comments of Heart of America Northwest, Washington Ecology and USEPA on the Hanford Site Solid Waste EIS.

<sup>20</sup> 42 USC 6925(c). See (c)(2)(C) for the duty of the Director of Ecology, administering an authorized hazardous waste program to make a final decision.

groundwater monitoring requirements. 42 USC 6925(e)(2) and (3).<sup>21</sup> If USDOE or any contractor has made such certification, or makes such certification, USDOE's own documents show such certification to be false. Further, USDOE and Hanford contractors have clearly failed to provide information required to process an application, which would include full compliance with SEPA and characterization of both dangerous wastes present in the landfills and hazardous substances released.

Both the Administrator and Director have nondiscretionary duties to deny issuance of final permits for these burial grounds for failing to meet the requirements for interim status and failure to provide adequate permit applications. The mandatory duty to deny the permit is clearly stated in 42 USC 6925 (c)

Repeated expansions, including new land disposal facility trenches, of the Low-Level Burial Grounds have occurred without USDOE and its contractors applying for, or receiving, RCRA and Washington State Hazardous Waste Management Act permits. Such expansions violated interim status requirements, permit requirements and other applicable laws.

Washington State law was repeatedly and knowingly violated by USDOE and its contractors by expanding the unlined soil trenches of the burial grounds:

Washington Administrative Code (WAC) Section 173-303-665 (Landfills) required liners and leachate collection systems for each new landfill unit or lateral expansion of a landfill unit and each replacement of a landfill unit, on which construction commenced after July 29, 1992. USDOE has knowingly and repeatedly violated this requirement. These violations have increased the quantities of hazardous substances that threaten the State's groundwater, Columbia River, and the health of persons and the environment due to releases. Indeed, all disposal of waste in unlined ditches after 1992 must be considered a release to the environment, since there is no effective barrier between the waste and the environment. Large quantities of Carbon Tetrachloride were undoubtedly disposed to the soil since the provisions of RCRA and WAC 173-303 barred expansion or creation of new unlined trenches for disposal of hazardous wastes. The Carbon Tetrachloride that was disposed in these illegal expansions has likely contributed substantially to the ongoing release of this toxic substance that poses a current imminent and substantial endangerment.

WAC 173-303-665(9) requires a "response plan", which must be approved by Ecology "before receipt of waste". The response plan must detail what action will be taken and how

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<sup>21</sup> Furthermore, the facility had to be in existence and operating as of November 19, 1980, and for land disposal facilities, the facility would have had to be granted interim status prior to November, 1984 and applied for a final permit within twelve months, in order to qualify of interim status. (42 USC 6925(e)(1), (2) and (3)). As noted herein, two of the Burial Ground Areas were not even in existence or in service as of 1982, and were opened for service in 1983 and 1986. Interim status was not available for land disposal facilities that were not in existence and operational before the statutory date granting interim status. Final permits were not applied for as required by November, 1985. Even if the land disposal facilities had been granted interim status at that time, it would have expired after twelve months after becoming subject to the permit requirements of RCRA because USDOE could not certify compliance with all applicable groundwater monitoring requirements. (42 USC 6925(e)(3)).

promptly when a leak is detected. USDOE can not detect leaks at all from the LLBG, because it failed to have liners and leachate collection systems with leak detection as required by law. USDOE has also failed to monitor the vadose or unsaturated zone to detect releases *before* they reach groundwater. However, these violations can not excuse USDOE and the contractors for the ongoing violation of the requirement to have a response plan for the LLBGs.

If there was a response plan that met legal requirements, then Heart of America NW would not be forced to seek an order of mandamus to require Ecology to initiate an investigation of the releases from the LLBG under the Model Toxics Control Act, RCW Chapter 70.105D.

**An enforceable timeline to apply the following standards at USDOE's Low-Level Burial Grounds, and any new landfills, must be part of any meaningful Groundwater Strategy:**

- liners for all new use of soil disposal units (milestone should be as of 1/1/04);<sup>22</sup>
- leachate collection systems;<sup>23</sup>
- leak detection systems;<sup>24</sup>
- groundwater and unsaturated (vadose) zone monitoring – (milestone should require fully compliant groundwater monitoring meeting the spacing, testing and data requirements by 1/1/2006);<sup>25</sup>
- response action plans;<sup>26</sup>
- notification of releases from landfills;<sup>27</sup>
- mapping the exact location of landfill cells with the contents of each dangerous waste type<sup>28</sup>;
- weekly and post-storm inspections of operating landfills to detect run-on, run-off and prevent wind dispersion of waste, and to ensure proper operation of leachate collection systems;<sup>29</sup>
- preventing the disposal of potentially incompatible hazardous substances and wastes in the same landfill cell;<sup>30</sup>
- prohibitions against expansions or new trenches without meeting all of the above;
- having a permit under RCRA or Washington's Hazardous Waste Management Act for the operation of the unlined Low-Level Burial Grounds and for their continued acceptance of wastes – only after all standards have been met;
- A compliance schedule with investigation for receipt of uncharacterized wastes for disposal without meeting the requirements of WAC 173-303 for waste identification, characterization, analysis and notification of waste types, and receipt of wastes in a

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<sup>22</sup> WAC 173-303-665(2)(h)

<sup>23</sup> WAC 173-303-665(2)

<sup>24</sup> WAC 173-303-665(2)

<sup>25</sup> 42 USSC 6925(i) and WAC Chapter 173-303-645

<sup>26</sup> WAC 173-303-665(9)

<sup>27</sup> E.g.: WAC 173-303-665(9)(b). USDOE's failure to have liners and leachate collection systems capable of detecting a release can not excuse its violation for failure to report releases that would have been detectable if USDOE had not failed to comply with the regulatory requirements.

<sup>28</sup> WAC 173-303-665(5)

<sup>29</sup> WAC 173-303-665(4)(b)

<sup>30</sup> WAC 173-303-665(7)

facility without a permit; where releases of hazardous substances are occurring (e.g., Carbon Tetrachloride from LLWMA4; and, for operation of landfill facilities for which interim status legally expired.

Comments on Appendix A.1.: The appendix erroneously identifies the only portions of the Low-Level Burial Grounds (Low Level Waste Management Areas 1-4) subject to 173-303-645 requirements as **only** mixed waste trenches 31 and 34.

As shown above, USDOE has repeatedly been found to have failed to properly characterize, segregate, track and designate hazardous Mixed Wastes that have been co-mingled and buried throughout the burial grounds. This was hardly limited to these few “islands” where USDOE deliberately stored or buried Mixed Wastes. Incredibly, even as we face releases of Carbon Tetrachloride from WMA4 at levels that are immediately dangerous to human health, USDOE does not acknowledge that hazardous wastes are present; and, does not recognize that RCRA and WA Hazardous Waste Management Act requirements are applicable.

This is not consistent with the Part A interim status permit (revisions 0-9), nor with the Part B Permit Application and the Notice of Deficiency issued by Ecology in 2003. It is appropriate that Ecology require a RCRA and WA HWMA closure plan for the entire LLWMA 1-4 units.

Furthermore, it is vital that WAC 173-303-645 groundwater requirements be identified in this strategy as applicable. If these requirements are not recognized as applicable in this Strategy, it will not be credible.

**Response:**

**The strategy identifies land-based units currently receiving regulated dangerous wastes in Section A-1 of Appendix A. As clearly stated in the strategy, these units are subject to detection/compliance monitoring and groundwater corrective action requirements of WAC 173-303-645. The units which are not defined as regulated units in WAC 173-303-040 , or are closed/closing land-based units, may (as identified in Section A.1) be eligible for provisions that allow groundwater and closure requirements to be**

**developed through the corrective action process under the authority of WAC 173-303-645 (1)(e). The wording in Appendix A will be revised to provide more clarity for the reader (see specific comment number 46).**

Ecology can not issue a final status operating permit for the non-compliant portions of LLWMAs 1-4 (i.e., unlined, inventory unknown, etc.), and must require a closure plan for the non-compliant portions or approve a plan that combines closure and corrective action. The first legally required step is a full investigation of releases and characterization of wastes present and released pursuant to MOTCA. Section A.1 appears to have been either crafted to evade groundwater requirements for the Low-Level Burial Grounds (LLWMAs 1-4).

Appendix A.3. : As noted above with great detail, it is not legally permissible for “Ecology to permit the active regulated portions of the LLBG...”

The LLBGs, as described above, can not meet minimum requirements, and must be closed and investigated. They do not have interim status, as described in detail above.

Ecology may only permit new landfills that have liners and leachate collection.....

To achieve the stated objective of ascertaining the degree of release (not whether there are any) Ecology must have a schedule for USDOE to meet the monitoring and response plan requirements.

The appendix appears to imply that LLWMAs 1-4 can be segregated “inactive past-practice units” and adjacent trenches that are “active”. (Appendix A.3 and A.1: At A.1, the Strategy implies that the only MW units in burial grounds are trenches 31 and 34.) This is impossible and not legally viable. As shown in the limited monitoring done for Carbon



Tetrachloride in the LLWMA4 burial ground, the trenches are so close that the active trenches are clearly impacted by the inactive trenches. Further, many of the trenches are claimed to have inactive portions within an active, open trench. Finally, none of these trenches have been legally closed, so there is no way that this artificial distinction can be drawn. This Appendix appears to have been designed to evade groundwater, closure and characterization requirements for the Low-Level Burial Grounds (LLWMAs 1-4).

The Appendix should have a clearly delineated schedule to achieve compliance with groundwater monitoring requirements and closure requirements.

The Strategy in footnote 4 to Appendix A wrongly implies that corrective action and monitoring requirements for radionuclides can not be issued by Ecology. This position is not supportable by law and is unacceptable for Ecology to agree to. First: clearly these releases are essentially “Mixed Wastes”, comprised of both radioactive and hazardous constituents, and it is necessary to monitor both. Secondly, MOTCA clearly requires monitoring and remediation of all released carcinogens. EPA has long recognized that radionuclides are subject to the cleanup levels required under the National Contingency Plan and meeting the CERCLA regulation’s cancer risk standards. SEE OSWER 9200.4-18: Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination”, U.S. EPA August, 1997.)

**Response:**

**The focus of this section of text is on unit-specific issues which are beyond the scope of an overarching framework document such as the groundwater strategy. Unit specific recommendations for facilities such as the Low Level Burial Grounds (LLBG) will be made in other regulatory documents such as permits and Records of Decisions. Each of these regulatory tools has requirements for public comment processes that will allow you to evaluate specific requirements and make comments to the Tri-parties prior to final decision making. The LLBG permit is currently in the Notice of Deficiency stage. Specific groundwater requirements will be included in the draft permit conditions**

The Strategy claims that “remediation” of waste sites will primarily be by use of surface “barriers”. (Previously in draft as A.4 This illegally adopts a plan to avoid full remediation, without even attempting to go through the MOTCA and CERCLA investigation and feasibility study processes, and to determine if retrieval and treatment are not practicable and preferred to meet relevant health based standards.

**Response:**

**We agree the original language may have given the reader the impression that barriers were the preferred remedy for remediation. That was not the intent of the strategy and the language was removed from the draft currently out for public comment. Remediation remedies will be selected after completion of the required remedial investigations and feasibility studies and public comment will be sought on the proposed remedies planned.**

Again, the conflict is between fundamental visions: whether these sites will ever be safe for reasonably foreseeable public use and from reasonably foreseeable intrusion and subsurface spread of contamination.

Additional Specific Comments on Draft Groundwater Strategy:

- 1. Throughout the document, the strategy needs to reflect a commitment to early detection, via leachate collection, and soil (vadose zone) monitoring, rather than emphasizing only groundwater monitoring. This is a significant shortcoming. By the time that contamination hits groundwater, it is too late for protection. Early detection is also required as a strategy with specific plans under WAC 173-303-645.**

Response:

The groundwater strategy does reflect a commitment to early detection, at least with respect to land-based disposal unit actively receiving new wastes. As explained in Appendix A, EPA and Ecology believe that these units should be designed, constructed and operated to prevent releases to the environment (including groundwater). Detection monitoring is an essential element of this philosophy, so that should releases occur, they can be addressed through timely and effective corrective measures. However, EPA and Ecology do not believe it is appropriate for a policy-based groundwater strategy to define the particular technologies or their application to any particular disposal unit – such analysis and determinations should be made through the corresponding regulatory actions and associated public comment processes.

The Tri-Parties do not agree, however, that detection monitoring (whether via leachate collection, vadose zone monitoring, or groundwater monitoring) are appropriate for all waste sites at Hanford. As explained in the strategy (See Section 5.2.1 of the Strategy), many waste sites have little or no significant inventory remaining in the surface unit or the vadose zone. In these instances, even if an effective detection monitoring system were in place, it is unlikely that it would yield data that would materially affect selection or implementation of an effective groundwater remedy for releases that may have originated from the unit. One of the main thrusts of the groundwater strategy is to provide a defensible framework within Ecology's authorized RCRA program to develop groundwater monitoring for these units that are closed or are in the process of closing that provides full compliance with applicable dangerous waste regulations, and that yields data that is useful for selecting and implementing groundwater cleanup remedies. The Tri-Parties believe that a strategy of mandatory detection monitoring without consideration of outstanding decisions and associated data needs would not support the Strategy's policy objective of a renewed focus on groundwater remediation, and of relating data needs to decisions needed for remedial activities and monitoring.

- 2. There needs to be a specific trigger for action when vadose zone or groundwater monitoring show a statistically significant increase in a contaminant. By failing to agree on such an action level, the strategy will be doomed to the same type of dispute over action and inaction as has marked leaks from Single Shell Tanks.**

Response:

Trigger levels were considered by the three agencies in developing the strategy. The Tri-Parties agreed that trigger levels should be evaluated on a location and contaminant-specific basis. The decision to trigger an action is much more complex than simply a "specific standard of contamination." Rather, the strategy establishes a series of considerations that include the

source inventory, identity of the constituent, how the constituent relates to what's already in the underlying plume, and what any planned remedy might focus on.

Of course, an increase in contaminant concentrations associated with a release from a waste management unit is one of the factors that the strategy establishes that should be considered when evaluating when a response action is necessary. In addition, the trigger proposed in this comment is relevant to monitoring of land-based disposal units currently receiving wastes, as discussed in Section 4.1 and Section A-1 of Appendix A.

A fixed trigger for all waste sites, particularly for past practice units, that is the sole determining factor for initiating remedial actions would be inconsistent with the groundwater protection framework established in Section 5.2.1 of the Strategy, in particular, Figure 2. The Tri-Parties believe that the graded approach to groundwater monitoring in this Section, including the focus on waste sites with environmentally-significant inventories and plumes that have the highest potential to threaten the Columbia River is superior to a "one-size-fits-all" with respect to protecting the Columbia River and protecting and remediating groundwater.

3. The title should add "detection". The word detection is a more meaningful word in relation to "protection" and "remediation". It should be noted that "monitoring" may occur without "detection". As such, before remediation or protection can occur, detection must first occur.

**Response:**

**As noted in the response to Comment 1, the Tri-Parties believe that in some instances a monitoring system focused on detection monitoring will not provide data necessary for making remedial action decisions. Adding "detection" to the title of the strategy as the comment suggests would not be consistent with the stated objective of the strategy to relate groundwater monitoring to decision-making data needs. The Tri-Parties note, however, that detection is an element of monitoring. Although the Tri-Parties do not agree that "detection" should be explicitly included in the title as proposed, "detection" is not precluded where it is necessary or justified.**

4. Section 1.0, Page 1. The first sentence of the Mission Section states: "...and to protect and remediate groundwater". The Model Toxics Control Act (MTCA) requires remediation of groundwater to its highest beneficial use. As Ecology is authorized to implement MTCA to satisfy Resource Conservation and Recovery Act (RCRA) corrective action requirements, the wording should be consistent with MTCA requirements. Recommended wording: "...and to restore groundwater to its highest beneficial use."

**Response:**

**The Tri-Parties agree with the goal that groundwater should be restored to its highest beneficial use. Footnote 1, which appears at the end of the strategy sentence quoted by this comment, so states. At Hanford, MTCA requirements are reflected in CERCLA decision documents (for CERCLA past practice units), through RCRA/HWMA closure requirements (for waste management units subject to dangerous waste closure requirements) and RCRA/HWMA corrective action requirements (for RCRA past practice units).**

**This comment also references Ecology’s implementation of the RCRA corrective action program. In seeking authorization for the corrective action authorities of RCRA at 40 CFR 264.101, Ecology outlined a corrective action program based on the technical requirements of the Model Toxics Control Act. However, EPA did not authorize use of MTCA to satisfy these RCRA corrective action requirements. Rather, EPA authorized Ecology issue permits containing corrective action conditions. In particular, EPA stated “In order to fulfil the RCRA Section 3004(U) and (v) requirement that all RCRA permits must include corrective action orders will be incorporated into RCRA permits issued pursuant to the authorized State permitting regulations.” See 59 Federal Register (FR) 55322, November 4, 1994. Further, EPA noted that “Under the Washington program, a State [MTCA] order would be considered to be part of the authorized RCRA program only when the order is incorporated into an existing RCRA permit, or when the order is issued simultaneously with and incorporated by reference into a new RCRA permit.”**

5. Section 2.0, Page 1. The 2<sup>nd</sup> bullet does not include MTCA, the Clean Water Act (CWA), or applicable well management regulations. The strategy is incomplete without describing how MTCA, CWA, and well management regulations will be satisfied.

**Response:**

**The Tri-Party Agreement establishes waste management and cleanup requirements for the Hanford site pursuant to CERCLA, RCRA, and the state Hazardous Waste Management Act (HWMA). The Strategy is intended to provide an implementation framework for these requirements, so that it is appropriately focused on the RCRA, CERCLA, as well as Atomic Energy Act (AEA) requirements. Consistent with this approach, MTCA and CWA requirements are expected to be reflected in individual CERCLA decision documents. In particular, see paragraph 17 of the Tri-Party Agreement, which clearly states that MTCA requirements “shall be incorporated where appropriate as ‘applicable or relevant and appropriate’ requirements pursuant to Section 121 of CERCLA.” MTCA requirements will also be reflected through imposition of RCRA closure and corrective action requirements in the site-wide permit. The Tri-Parties note that existing CERCLA RODs and permits already consider and include applicable MTCA standards.**

**Section 2.0 is intended to be a high-level summary of objectives, not a detailed enumeration or discussion of all regulatory requirements.**

6. Section 2.0, Page 1. The 2<sup>nd</sup> bullet should include an identification of where in the strategy the various regulatory roles are included. For example, the second bullet should identify that Appendix A includes the role of RCRA corrective action for groundwater. Similarly, the bullet should specify where in the strategy the role of the CWA is explained/described. Similarly, the bullet should specify where in the strategy the role of MTCA is explained/described. Similarly, the bullet should specify where in the strategy well management is described.

**Response:**

**See response for Comment 5**

7. Section 2.0, Page 1. The 3<sup>rd</sup> bullet implies that duplication and inconsistencies arise from multiple regulations. The bullet is written in such a way as to carry a “tone” and reflects an attitude that even the regulatory agencies consider groundwater regulations to require duplication and result in inconsistencies. If this bullet is to remain, it is recommended that it be re-written to drop the “tone”. Also, if the bullet is to remain, the document should include specific examples of “duplication” and “inconsistencies” that are occurring due to compliance. It could easily be argued that “duplication” and “inconsistencies” are not a product of regulatory requirements, but rather a function of how regulations are implemented. Furthermore, it could be argued that when groundwater decisions are not made in a defensible fashion “inconsistencies” happen. Furthermore, it could be argued that duplication could be a function of a lack of communication between Ecology, EPA, and USDOE rather than the fault of regulations. Lastly, if examples of duplication and inconsistencies are legitimate, it is recommended that Ecology, EPA, and USDOE contact Congress and request appropriate changes to regulations be made to address the issues of “inconsistencies” and “duplications”.

**Response:**

**There are several instances at Hanford where groundwater monitoring systems developed under separate regulatory programs have resulted in multiple wells being installed and/or sampled that yield essentially the same environmental data. The Tri-Parties and stakeholders agree that minimizing duplication or inconsistencies between regulatory programs is a legitimate goal of the groundwater strategy.**

**The Tri-Parties acknowledge that ineffective communications can lead to implementation issues with any regulatory program. The Tri-Parties have found that discussions during development of the groundwater strategy have proven valuable in gaining an understanding of values and interests with respect to groundwater remediation. By establishing a common vision of the Hanford groundwater program, the strategy is expected to help improve communications as the Tri-Parties establish implementation decision documents.**

**Finally, the Tri-Parties believe existing rules and regulations provide ample opportunity to reconcile groundwater requirements of the principle regulatory programs governing Hanford cleanups (RCRA, CERCLA and the AEA). In fact, much of the RCRA component of the strategy is based on existing state and federal rules specifically promulgated to address duplication and inconsistencies in groundwater requirements applicable to closed/closing regulated units and solid waste management units undergoing corrective actions. In this sense, the Tri-Parties do not believe it necessary to seek statutory or regulatory changes in order to fulfill the policy objectives of the strategy.**

8. Section 2.0, Page 1. The 4<sup>th</sup> bullet identifies an objective of supporting vadose and groundwater cleanup decisions in a “timely, effective, and efficient manner”. The standing record at the Hanford Site for supporting the vadose zone objective is dismal. For example, vadose zone monitoring is needed at several active RCRA TSDs (the Single-Shell Tanks [SSTs], the Liquid Effluent Retention Facility [LERF], certain Low-Level Burial Grounds [LLBGs], etc.) and the CERCLA Environmental Remediation Disposal Facility [ERDF]. However, SSTs will very likely initiate closure activities without vadose zone monitoring. Similarly, LERF and certain LLBGs are out of compliance with RCRA groundwater monitoring requirements due to wells going dry. Currently, there is no documented indication that USDOE or EPA support vadose zone monitoring to address groundwater monitoring network deficiencies at SSTs, LERF,

LLBGs, and ERDF. This bullet should be deleted as it does not honestly reflect the lack of support for vadose zone monitoring.

**Response:**

**It is not clear from the comment whether the commenter is suggesting that the strategy include a specific commitment to vadose zone monitoring or is questioning the commitment of the Tri-Parties to vadose zone cleanup. The comment does not appear to suggest any specific change to the statement that the strategy outlines groundwater protection, monitoring and remediation activities that support vadose zone and groundwater cleanup decisions in a timely, effective and efficient manner. Rather, it seems to focus more that there is a perceived lack of USDOE or EPA support for vadose zone monitoring to correct groundwater monitoring deficiencies at various units.**

**The Tri-Parties do not agree that vadose zone monitoring is an end in itself. Rather, vadose zone monitoring is one of a number of tools available to monitor the performance of waste management units and to make cleanup decisions. In this context, the merits of vadose zone monitoring, along with other means of obtaining environmental data, should be evaluated as part of unit-specific or operable-unit-specific decision document. The strategy includes consideration of both vadose zone and groundwater monitoring to provide early detection of contamination. Including those units that meet the criteria of WAC 173-303-645(1)(e) vadose zone monitoring will be considered when it is found to be the best or most appropriate way to obtain data necessary for cleanup or to achieve the objectives of the groundwater strategy. See also the fourth bullet item in Section 2.0 of the strategy.**

**As noted in the strategy, an important component in both groundwater and source unit remediation is understanding existing contaminant inventory (the amount, type and location in the various media of contaminants associated with the waste management unit or area wide contaminant plumes). In instances where contaminant inventory may exist in the vadose zone, vadose zone monitoring is certainly an appropriate tool to perform the necessary characterization monitoring. Where contaminants from a particular waste management unit are known or believed to have largely migrated to groundwater (as opposed to remaining in surface or vadose zone inventory), vadose zone monitoring would likely not provide significant data with respect to defining a groundwater remedy. In either instance, the vadose zone monitoring should be evaluated in the context of information needs associated with cleanup decisions, not established as a requirement in the groundwater strategy.**

9. Section 2.0, Page 1. The 4<sup>th</sup> bullet identifies an objective of supporting vadose and groundwater cleanup decisions in a “timely, effective, and efficient manner”. The standing record at the Hanford Site for supporting groundwater cleanup decisions in a timely, effective, and efficient manner is dismal. For example, under CERCLA, EPA has yet to issue the first final groundwater Record of Decision (ROD). As another example, Ecology has not, to date, formally and administratively exercised its RCRA and/or MTCA corrective action authority at the Hanford Site. While Ecology may claim that RCRA corrective action is occurring at the N Area, the process is so grossly deficient, it is non-defensible as a RCRA corrective action (note: RCRA corrective action is purported to be occurring via an interim CERCLA groundwater ROD). Similarly, the RCRA corrective action and CERCLA remedy selected (and purported to be occurring) via an interim CERCLA groundwater ROD in the 300 Area to address uranium

(half-life 4+ billion years) groundwater contamination is monitored natural attenuation. This remedy is non-defensible and should never have been considered a viable option for selection. As another example, technetium-99 groundwater concentrations at well 299-W23-19 have reached 187,900 pCi/L and have exceeded the “10X” CERCLA ROD “action” level for years without RCRA or CERCLA corrective action. As another example, the CERCLA 200 West Area carbon tetrachloride groundwater pump-and-treat system could be described as anything other than “efficient”. Repeated evaluations of the efficiency of the carbon tetrachloride have indicated that the characterization is so grossly deficient that the effort may actually be causing more harm than good. There are more examples of non-defensible, non-timely, ineffective, and inefficient groundwater cleanup decisions. To state that “timely, effective, and efficient” groundwater cleanup decisions are an objective is nothing short of disingenuous. This bullet should be deleted as it does not honestly reflect the true lack of support for making “timely, effective, and efficient” groundwater cleanup decisions.

**Response:**

**The Tri-Parties agree that the focus on groundwater remediation at Hanford has been secondary to source removal activities over the past few years. Indeed, one of the key drivers for development of the strategy is stakeholder input to the Tri-Parties that there needs to be a renewed focus on groundwater remediation as a means to protect the Columbia River and to complete Hanford cleanup. The remainder of the comment, however, is focused on unit-specific issues which are beyond the scope of an overarching framework document such as the groundwater strategy.**

10. Section 3.0, Page 2, 1<sup>st</sup> Bullet. It is recommended that the first bullet read as: “...to detect, remediate, and protect”.

**Response:**

**As noted in the response to Comment 1 above, with certain exceptions (e.g. land-based units currently receiving dangerous wastes) the Tri-Parties do not believe it is consistent with the goals of the strategy to focus on detection monitoring as an integral goal of the Hanford groundwater program. Rather, the Tri-Parties believe a focus on actual remediation best serves the goal of meeting Hanford cleanup objectives.**

11. Section 3.0, Page 2, 2<sup>nd</sup> Bullet. The strategy does not appear to include “the mission of the Hanford Groundwater Program”. Perhaps an additional goal would be to meet the EPA’s mission for protecting groundwater. Similarly, an additional goal would be to meet Ecology’s mission for protecting groundwater. Without providing an identification of “the mission of the Hanford Groundwater Program”, the reader does not know what USDOE’s mission is or if it is even consistent with Ecology’s and EPA’s missions.

**Response:**

**The Tri-Parties believe the mission statement in the strategy is consistent with the mission of the Hanford groundwater program, which is to protect the Columbia River from contaminated groundwater resulting from past, present, and future operations at the Hanford site and to protect and remediate groundwater. See in particular Section 1.0 of the strategy. Footnote 1 to this statement clearly articulates the RCRA/HWMA and CERCLA regulatory**

**requirement and policy objective that reflects EPA and Ecology expectations. The Tri-Parties believe the strategy clearly addresses the questions posed by this comment, and no change to the text is required.**

12. Section 3.0, Page 2, 2<sup>nd</sup> Bullet. The bullet does not include identification of MTCA, CWA, and well management requirements. As such, the bullet is incomplete.

**Response:**

**See response to comment 5 above.**

13. Section 3.0, Page 2, Bullets. It is noted with interest that none of the stated goals include “compliance” with regulatory requirements to protect groundwater and to restore groundwater to its highest beneficial use. By this omission, it appears that Ecology and EPA have agreed with USDOE that regulations do not have to be met.

**Response:**

**The Tri-Parties disagree with the comment. The groundwater strategy establishes compliance with regulatory requirements as an objective in Section 2.0. Section 3.0 is intended as an outline of key goals that must be met in order to achieve the stated objectives. The Tri-Parties strongly disagree with the commenter that any part of the strategy suggests that “regulations do not have to be met.” In fact, the stated purpose of the strategy is to identify applicable regulatory requirements and a mechanism for meeting the environmental objectives that they require.**

14. Section 3.0, Page 2. It is recommended that a bullet be included which identifies the goal of “doing no harm” to the groundwater. Technically, it may be argued that the 200 West Area carbon tetrachloride groundwater remediation may currently be doing more harm than good (i.e., the core plume is growing – possibly due to the design of the pump-and-treat system) due to lack of contaminant fate and transport characterization to support remediation design. Technically and legally, it may also be argued that the selection of monitored natural attenuation as an “interim” groundwater and surface water remedy for the 300 Area uranium contamination is “doing harm”. Technically and legally, it may also be argued that the lack of groundwater remediation in the N Area allows “harm” to the river and recipient ecosystems to occur.

**Response:**

**The concept of “do no harm” is captured in the last bullet of Section 3.0. The strategy also captures the “do no harm” concept in Footnote 1 to Section 1.0 (Mission), the first paragraph of Section 2.0 (Objective), Section 5.1 (the strategy for groundwater protection) and in Section 5.3, bullet 4. The remainder of the comment is focused on unit-specific issues which are beyond the scope of an overarching framework document such as the groundwater strategy.**

15. Section 3.0, Page 2, 10<sup>th</sup> bullet. The 10<sup>th</sup> bullet identifies a goal to minimize further degradation of groundwater during remedial and closure activities. In light of groundwater remediation decisions made thus far via the CERCLA interim RODs and the lack of formal implementation of RCRA groundwater corrective action, this bullet could be argued to be



disingenuous. Interestingly, the tank waste retrieval is offered as an example. It is very apparent that SST closure actions will very likely proceed on a fast track **without** vadose zone leak detection capabilities. In addition, it is very apparent that SST waste retrieval will advance **without** vadose zone leak detection capabilities with the logic that the action of removing waste will “minimize further degradation of groundwater during remedial and closure activities”. In fact, even though it is assumed that an average of 8,000 gallons of tank waste may be leaked from every SST during retrieval actions, the retrieval actions will very likely proceed **without** vadose zone leak detection. In other words, in context of what is occurring on the Hanford Site, this bullet does not add value to the stated goals. It is recommended the bullet be deleted.

**Response:**

**The Tri-Party Agreement (TPA) notes that in many instances, RCRA and CERCLA authorities overlap. See, for example, “Integration of RCRA and CERCLA” in the executive summary of the TPA Action Plan. The Tri-Party Agreement assigns all groundwater operable units to CERCLA authority. As noted in “Remedial and Corrective Action” in the cited executive summary, “Either the CERCLA remedial action or the RCRA/HWMA corrective action process will be used for the past-practice operable units.” EPA and Ecology agree that exercise of RCRA/HWMA corrective action for groundwater would be inconsistent with the Tri-Party agreement to exercise CERCLA remedial authority to address groundwater operable units (subject to Ecology’s reservation of corrective action authority in permit condition II.Y of the Sitewide Permit). While the comment implies that “lack of formal implementation of RCRA groundwater corrective action” is a shortcoming, the Tri-Parties believe this appropriately reflects TPA decisions that best support Hanford cleanup goals. The Tri-Parties do recognize that the RCRA/HWMA statute requires corrective action as necessary to protect human health and the environment. For this reason, Condition II.Y of the site-wide RCRA/HWMA permit incorporates by reference all CERCLA remedial actions consistent with TPA agreements as a means to satisfy corrective action (subject to certain reservations by Ecology).**

**The comment also cites that “it is very apparent that SST closure actions will very likely proceed [...] without vadose zone leak detection capabilities.” This observation is factually inconsistent with requirements currently in place for two of the first SSTs to undergo retrieval demonstrations, specifically S-102 and S-112 (See TPA Milestones M-45-05-T16 and M-45-3-T03). The baseline leak detection, monitoring and mitigation (LDMM) proposed for tanks S-112 and S-102 (both saltcake tanks) is static liquid level measurements and ex-tank gamma/neutron drywell logging. In addition, the Tri-Parties are actively testing and evaluating advanced LDMM technologies, which are expected to be implemented as an integral part of retrieval activities for tanks following S-102 and S-112.**

16. Section 4.0, Page 2. MTCA, CWA, and well management statutory requirements are not included. Of particular significance, since USDOE steadfastly maintains they have sole and complete authority over radionuclides, Ecology should recognize the authorities associated with water quality standards (which include radionuclide indicator standards). By the omission of broad statutory authorities associated with CWA and MTCA, it appears Ecology is unwilling to uphold the environmental protection programs for which they are authorized. If so, Ecology should identify that it formally forfeits its authority to ensure groundwater quality protection.

**Response:**

**The Tri-Party Agreement documents that all groundwater operable units will be addressed through CERCLA regulatory authority, in part since CERCLA has clear regulatory authority over the radiation hazards radionuclides. To the extent that they are applicable, or relevant and appropriate requirements, MTCA and CWA requirements are to be addressed as part of the CERCLA decision-making process. The comment, therefore, is implicitly addressed by the TPA and the strategy.**

17. Section 4.1, Page 3, 1<sup>st</sup> Bullet and Appendix A. The 1<sup>st</sup> bullet is unclear. The word “active” is used in relation to “RCRA land-based waste management units ‘regulated units’ (such as, landfills and surface impoundments that receive dangerous wastes)”. The wording is unclear and is inconsistent with RCRA definitions provided by WAC 173-303-040. Specifically, the WAC 173-303-040 definition of “active life” of a facility means “the period from the initial receipt of dangerous waste at the facility until the department receives certification of final closure”. In addition, the -040 definition of “active portion” means that portion of a facility which is not a closed portion...”. In addition, the -040 definition of “closed portion” means “that portion of a facility which an owner or operator has closed, in accordance with the approved facility closure plan and all applicable closure requirements”. In addition, the -040 definition of “closure” means “the requirements placed upon all TSD facilities to ensure that all facilities are closed in acceptable manner”. In addition, the -040 definition of “final closure” means “the closure of all dangerous waste management units at the facility in accordance with all applicable closure requirements so that dangerous waste management activities under WAC 173-303-400 and 173-303-600 through 173-303-670 are no longer conducted at the facility”. Perhaps most importantly, the -040 definition of “regulated unit” is “any new or existing surface impoundment, landfill, land treatment area or waste pile that receives any dangerous waste...”. Clearly, the wording used in the strategy is inconsistent with RCRA authorities that Ecology is authorized to implement. In addition, the wording lacks transparency (i.e., definitions of phrases are not provided). It is recommended that either the entire document be re-written to be consistent with regulations or that Ecology identify it is waiving its RCRA authority.

**Response:**

**To provide the requested clarification, the wording of the first bullet in Section 4.1 will be changed to:**

**“Verification of safe operation and management of regulated units (as defined in WAC 173-303-040) that are currently receiving dangerous waste that will protect groundwater.**

18. Section 4.1, Page 3, 1<sup>st</sup> Bullet and Appendix A. It is recommended that the bullet reference a location in the strategy where an identification of all units that are required to have groundwater monitoring under WAC 173-303-645 may be found. In addition, by the wording, it is unclear whether or not the bullet includes units at which unremediated releases have occurred (i.e., SSTs). Clearly, the SSTs will be “active” for decades. Similarly, as final closure certifications have not been received for many of the RCRA units subject to -645 requirements, the list of “active” units is anticipated to consist of approximately two dozen RCRA TSD units (i.e., 1) 1301-N Liquid Waste Disposal Facility [LWDF], 2) 1324-N/NA LWDF, 3) 1325-N LWDF, 4) 183-H Solar Evaporation Basins, 5) 216-A-29 Ditch, 6) 216-B-63 Trench, 7) 216-B-3 Pond, 8) LERF, 9) 216-A-10 Crib, 10) Waste Management Area [WMA] A-AX, 11) WMA B-BX-BY,

12) WMA C, 13) Low Level Waste Management Area [LLWMA] 1, 14) LLWMA 2, 15) 216-S-10 Pond and Ditch, 16) 216-U-12 Crib, 17) WMA S-SX, 18) WMA T, 19) WMA TX-TY, 20) WMA U, 21) LLWMA 3, 22) LLWMA 4, 23) 316-5 Process Trenches, 24) Nonradioactive Dangerous Waste Landfill [NRDWL], and 25) LLWMA 5 (if used)).

**Response:**

**The strategy identifies land-based units currently receiving regulated dangerous wastes in Section A.1. As clearly stated in the strategy, these units are subject to detection/compliance monitoring and groundwater corrective action requirements of WAC 173-303-645. The remainder of the units cited in the comment are either not “regulated units” as defined in WAC 173-303-040, or are closed/closing land-based units, which the strategy identifies in Section A.1 as “...subject to the traditional groundwater monitoring requirements of WAC 173-303-645 but may also be eligible for provisions that allow groundwater and closure requirements to be developed through the corrective action process under the authority of WAC 173-303-645(1)(e)”. All RCRA treatment, storage, and disposal units at Hanford are enumerated in Appendix B to the TPA, along with an identification of their regulatory pathway (closure, operating permit). The strategy will be modified to include a reference to TPA Appendix B in the second paragraph of Section A.1. The remainder of the comment is focused on unit-specific issues which are beyond the scope of an overarching framework document such as the groundwater strategy.**

19. Section 4.1, Page 3, 1<sup>st</sup> Bullet and Appendix A. Due to the lack of clarity of the first bullet and Appendix A, it is also recommended that Appendix A provide an identification of all units for which closure certifications have been received by Ecology. In addition, it is also recommended that Appendix A provide a status of Ecology’s verification and approval of those closure certifications.

**Response:**

**This comment addresses unit-specific details which are beyond the scope of the groundwater strategy. Perhaps more importantly, the distinction of whether closure certifications have been received is irrelevant to unit classification framework outlined in the strategy.**

20. Section 4.1, Page 3, 2<sup>nd</sup> Bullet. The bullet identifies verification of closure performance standards for cleanup of groundwater and monitoring of groundwater for closed/closing land-based units as a “key” area of focus. As an example of “focus failure”, the closure plan entitled *100-NR-1 Treatment, Storage, and Disposal Units Corrective Measures Study/Closure Plan* (DOE/RL-96-39, Rev. 0) states that RCRA monitoring during and after closure activities will continue, according to the existing interim status monitoring plan. A review of *Groundwater Monitoring Plan for the 1301-N, 1325-N, and 1324-N/NA Sites* (WHC-SD-EN-AP-038, Rev. 2) indicates groundwater is being monitored without an adequate number of groundwater monitoring wells to “immediately detect any statistically significant amounts of hazardous waste or hazardous waste constituents that migrate from the waste management area to the uppermost aquifer” as required by 40 CFR 265.91 and WAC 173-303-400. Clearly, for 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench], there are an inadequate number of RCRA

groundwater monitoring wells to satisfy applicable interim status regulatory requirements (much less final status requirements that are applicable via the TPA for RCRA closure). It should be noted that the existing groundwater monitoring network is grossly deficient and could require the installation of over 100 additional RCRA groundwater monitoring wells at the point of compliance to “immediately detect any statistically significant amounts of hazardous waste or hazardous waste constituents that migrate from the waste management area to the uppermost aquifer”. Furthermore, the 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench] units are currently in a state of open excavations (i.e., closure activities have been halted). Currently, the units remain quite “active” and -645 groundwater monitoring requirements are applicable. Furthermore, -645 groundwater monitoring requirements will be applicable during post-closure for both units. It is recommended that the second bullet reference an appendix where a description of the lengthy Hanford Site RCRA TSD closure process may be found. It is also recommended that the second bullet reference an appendix where a schedule and status of all Hanford Site RCRA TSD units subject to -645 monitoring requirements may be found.

**Response:**

**This comment is unit-specific, and beyond the scope of the strategy. As noted in several previous comments, these unit-specific details will be resolved in the applicable RCRA or CERCLA decision-making processes. The comment, however, does contain some misinterpretations of the strategy and the regulatory requirements of WAC 173-303-645. First, the unit classification described in Appendix A is intended as a means of establishing which regulatory requirements apply to particular groups of units. While the “operational status” of the 1325-N Crib and 1301-N Crib is as noted in the comment, both units have received their last volume of wastes, and are therefore in the closure process. These units correctly belong in the second group of RCRA units as outlined in Section A.1 of the strategy, even though the units have been certified by DOE as being closed according to the approved closure plan.**

**Second, WAC 173-303-645 requirements “will be applicable during post-closure...” One of the key points of the strategy, however, is that WAC 173-303-645(1)(e) specifically allows for the replacement of “all or part of the requirements of this section with alternative requirements for groundwater monitoring and corrective action when he or she determines....” Therefore, the comment reflects an incomplete reading of the applicable dangerous waste regulations.**

21. Section 4.1, Page 3, 2<sup>nd</sup> Bullet. The bullet identifies verification of closure performance standards for cleanup of groundwater and monitoring of groundwater for closed/closing land-based units as a “key” area of focus. The 300 Area Process Trenches also represent an example of “focus failure”. Fundamental groundwater quality standards are ignored by the CERCLA interim ROD remedy of monitored natural attenuation. It should be noted that the existing groundwater monitoring network is so deficient that conceptual models of uranium contamination fate and transport cannot be validated. As such, it may be concluded that not only are groundwater quality standards being ignored but that there is a considerable lack of contaminant characterization and a significantly deficient monitoring capability.

**Response:**

**This comment is unit-specific, and beyond the scope of the strategy.**

22. Section 4.1, Page 3, 2<sup>nd</sup> and 3<sup>rd</sup> Bullets. Due to the lack of clarity associated with remediation processes followed at the Hanford Site, it is recommended that the second and third bullets reference an appendix where clear descriptions and statuses of closure and corrective action processes that have been “integrated” with CERCLA be included. There are significant examples of units subject to RCRA closure and corrective action that have been “integrated” with CERCLA which lack transparency as to which applicable regulatory requirements are satisfied. For example, a recent Explanation of Significant Differences referenced *Interim Remedial Action Record of Decision for the 100-NR-1 Operable Unit of the Hanford 100-N Area, Hanford Site, Benton County, Washington* and *Interim Remedial Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units of the Hanford 100-N Area, Hanford Site, Benton County, Washington* as the administrative decision-making process. However, the referenced document does not clearly identify how RCRA-specific applicable regulatory requirements will be addressed. Similarly, it appears RCRA closure decisions are currently be made using an **interim** CERCLA administrative process. It can be argued that use of interim CERCLA administrative process which separates the RCRA unit from the contaminated groundwater (note: EPA guidance considers contaminated groundwater to be part of the TSD unit) is inappropriate and represents little more than a shell game designed to confuse, divide, and conquer. Neither is the decision-making process clear nor does it allow an identification of which applicable regulations are being satisfied. Clearly, under the guise of this Hanford-unique, convoluted, maze-like administrative process, applicable ARARs are not being addressed by CERCLA and fundamental RCRA requirements are not being satisfied by RCRA and there is absolute silence regarding the MTCA corrective action requirements and fundamental CWA groundwater protection requirements.

**Response:**

**This comment appears specific to an existing unit-specific decision document, and is therefore beyond the scope of the strategy. The Tri-Parties note, however, that CERCLA remedies, RCRA closures, and RCRA corrective actions fundamentally are based on achieving the same level of risk-based environmental performance. While the Tri-Parties always welcome comments on how regulatory decision documents can be improved during the appropriate public comment period, the Tri-Parties disagree that there is any fundamental issue with RCRA/HWMA closure decisions being made through the CERCLA process. Indeed, one of the means to integrate regulatory processes at Hanford is to incorporate CERCLA decisions into the Hanford site-wide permit as a means of satisfying RCRA/HWMA corrective action and closure requirements. Paragraph 19 of the Tri-Party Agreement further expands on this concept, establishing that “...the Parties recognize and agree that remediation of groundwater contamination from TSD units at the Hanford Site may be managed either under Part Three of this Agreement, or under Part of this Agreement, in accordance with the Action Plan.” Therefore, segregation of groundwater from the associated RCRA unit is not a shell game intended to confuse, but a deliberate choice by the Tri-Parties as an approach best suited to achieving Hanford cleanup goals. While the Tri-Parties intend to use the flexibility agreed to in the TPA to meet cleanup objectives, Ecology does reserve the right to exercise its authority under RCW 70.105 to require response actions consistent with that chapter.**

23. Section 4.1, Page 3, 2<sup>nd</sup> and 3<sup>rd</sup> Bullets. Due to the lack of clarity associated with remediation processes followed at the Hanford Site, it is recommended that the second and third bullets reference an appendix where clear descriptions and statuses of RCRA groundwater monitoring programs may be found. It should be noted that there are significant examples of incorrect monitoring programs currently being implemented. For example, and in relation to the 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench] units, repeatedly, specific conductance has exceeded the calculated critical mean in wells located downgradient from the regulated units, but the RCRA TSD units remain in an “indicator parameter” monitoring program. Apparently, it has been erroneously concluded that the exceedance was due to “non-hazardous constituents”. Waste constituents being released from the 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench] that are influencing specific conductance **are** indications of releases from the regulated units that are negatively impacting groundwater. Waste constituents **are** regulated and do impact water quality. Therefore, the correct groundwater monitoring program should be that of “compliance monitoring” under -645. As such, the identification of which monitoring programs are currently being performed should include an identification of whether the unit is interim or final status. If the unit is performing interim status monitoring, an identification of whether the monitoring program is “indicator parameter” or “assessment” should be made. Similarly, if the unit is performing final status monitoring, an identification of whether the monitoring program is “detection”, “compliance”, or “corrective action” should be made.

**Response:**

**This comment is unit-specific, and beyond the scope of the strategy.**

24. Section 4.1, Page 3, 2<sup>nd</sup> and 3<sup>rd</sup> Bullets. Due to the lack of clarity associated with remediation processes followed at the Hanford Site, it is recommended that the second and third bullets reference an appendix where clear descriptions and statuses of RCRA groundwater monitoring compliance determinations may be found. The Federal Facility Compliance Act (FFCA) amended the Solid Waste Disposal Act (SWDA) and clarifies provisions regarding application of certain requirements to Federal Facilities. The SWDA/FFCA requirements include facility environmental assessments. Specifically, the SWDA, amended by FFCA, addresses Federal Facility Inspections at Section 6927(c). Section 6927(c) includes the requirement for the Federal Administrator to conduct a groundwater monitoring evaluation at the facility when it is first inspected under the FFCA, unless a groundwater monitoring evaluation had been done in the previous 12 months. Clearly, there are applicable inspection requirements that are not being upheld. EPA and/or Ecology should demonstrate that the required RCRA groundwater compliance evaluations have been performed.

**Response:**

**The groundwater strategy is not intended to establish inspection requirements for EPA or Ecology. EPA and Ecology note, however, that the relevant section of the SWDA/FFCA is incorrectly cited in the comment. The statute does not contain language specifically requiring a groundwater inspection. Traditionally, EPA has established the policy expectation that land disposal facilities be subject to Comprehensive Monitoring Evaluation or**

**Operations/Maintenance Evaluations groundwater inspections every third year. According to EPA's hazardous waste data base, a Comprehensive Monitoring Evaluation inspection was conducted on December 6<sup>th</sup> and 7<sup>th</sup> of 2000, so that Hanford groundwater inspections are current according to existing program guidance. EPA and Ecology remain committed to an effective compliance program at Hanford consistent with statutory requirements and program policy.**

25. Section 4.1, Page 3. The text indicates that as action decisions are “developed” as per the TPA Milestone M-20 schedule, “associated groundwater monitoring requirements will be based on satisfaction of the cited regulatory requirements”. As such, it is requested that an appendix include an identification of each of the RCRA TSD units subject to -645 groundwater monitoring and the corresponding Milestone M-20 schedule. The significance of this request is that considerable resources may be required to support the Milestone M-20 schedule. For example, to include groundwater monitoring information in the closure decision-making efforts, compliant groundwater monitoring should occur at least one year prior to closure actions. Therefore, it is assumed that compliant groundwater monitoring networks and programs should be in place prior to Ecology's approval of closure plans (i.e., 216-S-10 Pond and Ditch, 216-U-12 Crib, WMA S-SX, WMA T, WMA TX-TY, WMA U, WMA A-AX, WMA B-BX-BY, WMA C, LLWMAs 1-5, etc.).

**Response:**

**Much of the information requested by this comment already appears in TPA Appendix B. However, the strategy clearly states that unit-specific details and schedules are to be developed as part of unit-specific decision documents (in this case, the site-wide permit). Further, TPA milestone M-20 is specifically intended as a schedule of compliance for unit-specific permitting at land-based units at Hanford. Since the strategy is not intended to replace TPA milestones, inclusion of information in the strategy as this comment suggests is not appropriate.**

26. Section 4.1, Page 3. The text uses words and phrases that are inconsistent with WAC 173-303. It is recommended that the phrase “regulated unit” not be used. Also, as the majority of the RCRA TSD units have not submitted final closure certifications and groundwater monitoring is required during post-closure, it is recommended that wording such as “RCRA TSD units subject to -645 groundwater monitoring requirements” be used instead of words and phrases that are not consistent with WAC 173-303.

**Response:**

**See the response to comment 17.**

27. Section 4.1, Page 3. The following sentence is unclear: “Groundwater monitoring for closed/closing RCRA land-based units ‘regulated units’ may either be on a unit-specific basis or part of a broader groundwater operable unit monitoring system.” The sentence is unclear because it does not use terminology consistent with WAC 173-303. In addition, the sentence is unclear because it does not provide assurance that WAC 173-303 groundwater monitoring requirements will be upheld. For example, the strategy proposes to “integrate” RCRA, CERCLA, and AEA requirements. During the last TPA Milestone M-24 negotiations, Ecology and EPA agreed to install a well south of TX-TY WMA. The well is not located at the unit's

RCRA point of compliance and may be concluded to not satisfy RCRA groundwater monitoring requirements of WAC 173-303. Similarly, it may be concluded that WAC 173-303 groundwater requirements are being waived for the 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench] units. Therefore, there is concern the approach being described in this strategy may not satisfy regulatory requirements for which Ecology is authorized to uphold. Again, the strategy should clearly identify **how, when, and which** WAC 173-303 groundwater requirements will be satisfied. At the very least, the sentence should be deleted as it is unclear and may be interpreted to mean Ecology is willing to not uphold RCRA regulatory requirements.

**Response:**

**To provide the requested clarification, the second sentence of the third paragraph of Section 4.1 will be modified to read:**

**“Groundwater monitoring for closed/closing RCRA land-based units (regulated units as defined by WAC 173-303-040)) may either be on a unit-specific basis according to WAC 173-303-645(2), or as part of a broader groundwater operable unit monitoring program according to WAC 173-303-645(1)(e).”**

**Elements of the comment relating to TX-TY wells, and the 1325-N and 1301-N Cribs are unit specific, and beyond the scope of the strategy. Finally, with respect to RCRA groundwater monitoring requirements, the strategy is explicitly based on the regulatory requirements for which Ecology has received authorization to implement in lieu of the federal program. The strategy provides a framework within which unit-specific decisions can be made, but is not intended to define all unit-specific groundwater monitoring or remediation requirements. Indeed, the language of WAC 173-303-645(1)(e) requires certain findings must be made as part of a unit-specific enforceable document, and cannot be made as part of a policy-level strategy. The groundwater strategy is intended to outline when particular regulatory provisions may be applied, but leaves specific decisions to unit-specific decision documents.**

28. Section 4.1, Page 3. The text describes the SSTs as “non-compliant...systems with documented releases to the environment...”. The same words could be used to describe all Hanford Site unlined surface impoundments. Furthermore, due to the use of groundwater monitoring networks at unlined surface impoundments, the units are non-compliant with WAC 173-303 groundwater monitoring requirements. Again, it is recommended that the compliance status of all RCRA TSDs subject to WAC 173-303 groundwater monitoring requirements be described in the document.

**Response:**

**There are several factors that justify distinguishing between single-shell tanks and unlined surface impoundments. First, there are no unlined surface impoundments at Hanford which continue to actively manage wastes, at least in the sense of bulk liquids. While there are certainly waste residuals in the near-surface and vadose zones and in groundwater, these units naturally fit into the second class of waste management units enumerated in Section A.1. In other words, the environmental and regulatory issues posed by these closed/closing unlined surface impoundments are very similar to cribs and trenches that managed liquid wastes. These units also are clearly “regulated units” as defined by WAC 173-303-040.**



Single shell tanks, on the other hand, are defined as tanks (albeit non-compliant) and subject to the tank-specific closure requirements of WAC 173-303-640. As such, SSTs are not “regulated units,” at least until and unless a formal decision is made pursuant to WAC 173-303-640 and the site-wide permit (when the currently-draft SST closure plan is formally incorporated into the site-wide permit) that the SST tank systems cannot close by removal or decontamination and must close according to landfill standards. Perhaps more importantly, the diverse information needs for retrieval, closure and safe stewardship of wastes remaining in SSTs until retrieval and closure justify distinguishing between SSTs and closed/closing land-based units. This distinction is appropriate in the context of the groundwater strategy and establishing a defensible and appropriate regulatory framework for groundwater monitoring. This distinction is not intended to imply that unlined surface impoundments are or are not compliant with any particular regulatory requirements.

Finally, the purpose of the groundwater strategy is not to enumerate unit-specific circumstances, or to serve as a compliance or enforcement document. To the extent that these factors are relevant to establishing regulatory requirements for any particular unit, they should be evaluated in the context of developing unit-specific decision documents.

29. Section 4.1, Page 3. The text describes the approach for the SSTs. It is recommended that an appendix include a status and schedule of the RCRA Subpart S corrective action process being followed for the SSTs. Also, it is recommended that the appendix identify that the U WMA is not formally being addressed by Milestone M-45. Similarly, it is recommended that the appendix identify that the C and A-AX WMAs are not considered subject to RCRA corrective action merely because their grossly deficient groundwater monitoring networks have not “detected” releases from C and A-AX WMAs impact to groundwater. Similarly, it is recommended that the appendix identify when (by year) each RCRA Facility Investigation (RFI) is anticipated to be complete. Similarly, it is recommended that the appendix identify when (by calendar year) each RCRA SST WMA Field Investigation Reports will be complete. Similarly, it is recommended that the appendix identify when (by calendar year) any Phase 2 field investigations will be conducted (i.e., for S-SX WMA).

**Response:**

**Much of this comment deals with information that is already in the TPA or the site-wide permit. The Hanford site-wide permit already incorporates milestones related to past-practice units as a schedule of compliance pursuant to Section 3004(u). Waste management areas C and A-AX are identified by the TPA as subject to closure requirements, which in turn must address releases to all media. TPA milestone M-45 already includes requirements and schedules for completing work under RCRA corrective action authority at SST tank farms.**

30. Section 4.1, Page 4. The last paragraph indicates that monitoring for radionuclides “shall be in accordance with DOE Orders dealing with radiation protection of the public and the environment and radioactive waste management”. Clearly, Ecology is exercising no authority over radionuclides. The section should identify that Ecology has chosen not to uphold CWA authorities to protect Washington State groundwaters in relation to radioactive constituent contamination.

**Response:**

**See response to comment 5.**

31. Section 4. The section omits identification of additional applicable statutory authorities, specifically, MTCA and CWA. As such, the section is incomplete.

**Response:**

**See response to Comment 5.**

32. Section 5.0, Page 5. It is recommended that the following bullets be used and in the following order: “Contamination detection”, “Remediation of contaminated groundwater”, “Groundwater protection”. The use of the word “monitoring” may be interpreted as “selectively looking” which could result in non-detection. Clearly, the goal to protect can only occur by support of a goal to “detect”.

**Response:**

**See response to Comment 1 above.**

33. Section 5.1.1, Page 6. A sentence in the first paragraph states: “Design and operation of waste management units currently accepting RCRA regulated waste (including new or expanded units) must reflect the minimum technology and groundwater monitoring requirements of RCRA.” This statement is very troubling. It appears to mean that Ecology does not recognize unlined surface impoundments as units which compliance will be obtained. This statement does not reflect the “cradle-to-grave” waste management model of RCRA nor the requirements of RCW 70.105. If this statement is to remain, very clear identification that Ecology is waiving its RCRA authorization should be included. In addition, if this statement is to remain, an identification that Ecology may not require SST groundwater monitoring networks to comply with WAC 173-303-645 requirements due to the fact that the SSTs do not “currently accept RCRA regulated waste”. Either the sentence should be deleted or the section should clearly identify that Ecology will not require numerous RCRA TSD units that are subject to groundwater monitoring requirements (i.e., LLWMAs 1-4 excluding mixed waste trenches 31 and 34, SST WMAs, 1301-N LWDF, 1324-N/NA LWDF, 1325-N LWDF, 216-A-29 Ditch, 216-A-10 Crib, 216-S-10 Pond and Ditch, 216-U-12 Crib, etc.) to comply with those requirements. This strategy appears to be more about evading regulatory requirements than protecting Washington State groundwaters.

**Response:**

**It is not clear what is intended by the first part of this comment, since there are no unlined surface impoundments at Hanford that are receiving new wastes. The first paragraph of Section 5.1.1 (“Operation of Waste Storage and Disposal Facilities”) is not intended to apply to units that are no longer actively receiving new wastes.**

**As tank systems, SSTs are not required to comply with WAC 173-303-645 groundwater monitoring requirements (although the requirements of TPA milestone M-24 do apply, as do the requirements of milestone M-45). Until and unless a closure plan for SSTs has been incorporated into the site-wide permit, and DOE demonstrates that “not all contaminated soils can be practicably removed or decontaminated” (WAC 173-303-640(8)(b)), the requirements of WAC 173-303-640 do not impose groundwater monitoring requirements on SSTs. Although**

the TPA anticipates that SSTs will be addressed through the closure process of WAC 173-303-610 and 640, SSTs are also solid waste management units subject to corrective action authority. As a matter of policy, regulated units certified closed according to an approved closure plan will also satisfy corrective action requirements as of the closure plan approval date. Ecology also notes that certain corrective action requirements are currently in place pursuant to TPA milestones M-45-55 through -60 in advance of closure plan approval.

34. Section 5.1.2, Page 7. The text describes how agreements regarding a “core zone” will guide “considerations for near-term action”. As such agreements are not appropriate application of RCRA, MTCA, or CWA, the text should clearly identify that use of “core zone” or “alternate compliance points” at this time as described in this strategy does not satisfy RCRA or MTCA groundwater and corrective action decision-making requirements. Again, if Ecology is not going to implement the RCRA or MTCA programs as authorized, Ecology should waive identify that it is waiving its statutory authorities to protect Washington State groundwaters.

**Response:**

The Tri-Parties disagree with the comment that establishing a core zone is not an appropriate application of applicable regulatory authority. Indeed, consideration of reasonable and likely land use is a core element of any environmental cleanup decision. Basing 200-area cleanup decisions on the premise that there will not be long-term waste management activities would be inconsistent with the practical realities of cleaning up one of the most complex, radiologically-contaminated site in existence. The Tri-Parties are committed to the concept that long-term waste management will occur in the core zone, and that “considerations for near-term action” are appropriately based on this concept. The Tri-Parties fully agree that waste management activities in the core zone must be premised on preventing further degradation of groundwater.

The Tri-Parties do agree that the scope of the core zone should be minimized to the extent practicable consistent with the long-term waste management activities necessary to complete Hanford cleanup. As noted in the Strategy, the Tri-Parties have a clear commitment to technology development as it relates to groundwater contamination, with the intent to minimize the size of the core zone.

As noted elsewhere in this response to comments, Ecology and EPA believe that the groundwater strategy is a defensible application of RCRA rules for which Ecology as received authorization to implement. As noted in comment 4 above, Ecology has not received any authorization from EPA for the MTCA program in lieu of any federal regulatory authority. In either instance, there is no basis for the groundwater strategy to state that Ecology is waiving any statutory or regulatory authority, regardless of authorization status.

The Tri-Parties agree that language relating to “alternate compliance points” was incorrect and has been removed.

35. Section 5.2, Page 10, 1<sup>st</sup> Bullet. It is recommended that the words: “by use of compliant groundwater monitoring networks” be added to the end of the first bullet. There are numerous examples of where “detection” is simply not occurring due to the general state of non-compliance.

**Response:**

**See response to comment 1.**

36. Section 5.2, Page 10, 4<sup>th</sup> Bullet. The bullet states: “Verify that Hanford contaminants are not present in offsite groundwater”. As the strategy identifies the use of alternate compliance points (i.e., “core zone”) and numerous examples exist where inadequate groundwater monitoring is occurring (i.e., SST WMAs, LLWMAs 1-4, LERF, 216-S-10 Pond and Ditch, 216-U-12 Crib, 316-5 Process Trenches, etc.), there is concern that the fourth bullet implies the active use of a “buffer zone” consisting of groundwater between waste sites and the Hanford Site boundary or the Columbia River. In general, the groundwater strategy does not provide adequate assurances of intent to detect contamination or a willingness to protect Washington State groundwaters.

**Response:**

**This bullet is included to reflect the current and future groundwater monitoring activities offsite of the Hanford facilities/Site (off and beyond the Hanford Site Nuclear facilities) to make sure groundwater in those areas is not contaminated from the Hanford sources. These are carried out under several monitoring programs such as sitewide surveillance program, AEA, etc. The strategy neither identifies alternate compliance point/point of compliance for any TSDs/units nor put any limits on groundwater monitoring for any waste units/TSDs at the site. Waste Unit/TSD specific monitoring to meet regulatory and technical requirements is covered under other bullets of the same section.**

37. Section 5.2, Page 10. It is recommended that an additional bullet be added which states: “Verify which Hanford contaminants are being released to the Columbia River”.

**Response:**

**The Tri-Parties agree, and have modified the 4<sup>th</sup> bullet to say “Verify that Hanford contaminants are not present in offsite groundwater and monitor the Columbia River for any possible Hanford releases.**

38. Section 5.2.1, Page 10. The data quality objectives (DQO) process is described. What is not indicated is that, to-date, the Tri-Parties have not acknowledged the boundaries of groundwater monitoring needs. In other words, an identification of a total number of groundwater monitoring wells that could be required to satisfy each statute (i.e., RCRA, CERCLA, MTCA, CWA, AEA, etc.) has not been generated. Without an acknowledgement that the “need” is tremendously larger than the “supply”, the DQO process fails by virtue of not “defining the boundaries of the study area” (i.e., how many wells are needed at the Hanford Site, when are wells needed at the Hanford Site, etc.). Without an acknowledgement of the “needs” (or the boundaries), the resulting DQO is non-defensible. The DQO process described to have been followed is fatally flawed due to what appears an inadequate basis. Furthermore, the description indicates a priority of addressing contamination after it has been detected rather than detecting contamination.

**Response:**

**This comment largely misses one of the central objectives of the groundwater strategy, which is to develop integrated groundwater monitoring networks which concurrently satisfy the needs of RCRA, CERCLA and the AEA. In developing the strategy as a means to this**

**objective, the Tri-Parties see no need what so ever to separately evaluate the “total number of groundwater monitoring wells that could be required to satisfy each statue.”**

39. Section 5.2.1, Page 12. The first bullet on the page indicates that the use of vadose zone monitoring will be considered “when practicable”. Considering the lack of agreement to install vadose zone monitoring at the new ERDF cells, this bullet does not appear to accurately reflect EPA’s and USDOE’s lack of willingness to monitor the vadose zone. Of course, vadose zone monitoring is “practicable” at new ERDF cells. Similarly, vadose zone monitoring would be “practicable” at new surface impoundments. However, there is currently no USDOE commitment or CERCLA ROD requirement to install simple access tubes beneath unconstructed ERDF cells. It is recommended that the bullet be either re-written or deleted.

**Response:**

**Requirements for new ERDF cells have been specified in the applicable ERDF ROD amendment, dated January 2002. The Tri-Parties disagree that EPA and USDOE are characterized by a lack of willingness to monitor the vadose zone. The response to comment E.1 of the amended ERDF ROD clearly document not only the willingness, but the requirement to consider vadose zone monitoring, and to incorporate the results, if appropriate, into ERDF Phase III. More recently regulators are evaluating USDOE’s agreement to deploy vadose zone monitoring devices (lysimeters and access tubes) (ref DOE/RL-2003-31, Rev.0) at ERDF and see/evaluate its performance. More studies on the feasibility of vadose zone monitoring is currently in progress. A review of these requirement, however, and the decision process leading to them is beyond the scope of the strategy.**

**It is not clear why the comment addresses new surface impoundments, since there are no plans or milestones to construct new surface impoundments where the issue of vadose zone monitoring might be an issue.**

40. Figure 2, Page 13. The second diamond on the figure uses the word “trigger”. This word is not defined or supported by regulation. Also, it is not identifies where these “triggers” would be found. It is recommended that a more meaningful phrase be used (i.e., “corrective action level”). It should be noted the “10X” action levels included in interim CERCLA RODs for the 200 West Area are not supported by adequate basis as being “protective”. As such, considering the tank waste contamination emanating from the SST WMAs, “1X” may be more appropriate as an action level. It should also be noted that although well 299-W23-19 has reached a technetium-99 concentration of 187,900, to-date, the CERCLA interim ROD does not address the SST contamination. Clearly, the action level selected for permits/RODs, etc. must be based on an evaluation of protectiveness and remediation goals (i.e., containment at concentrated source).

**Response:**

The intent of the “trigger” concept is to provide means to cost effective characterization and monitoring approach to meet our overall focus on groundwater remediation and protection of the Columbia River. A fixed trigger for all waste sites would be inconsistent with the groundwater protection framework established in Section 5.2.1 of the Strategy. The Tri-Parties believe that the graded approach to groundwater monitoring, including the focus on waste sites

with environmentally-significant inventories and plumes that have the highest potential to threaten the Columbia River, is superior to a “one-size-fits-all” approach to Hanford groundwater cleanup. See also Comment 2.

41. Figure 2, Page 13. The third diamond on the figure indicates there is a decision to be made ONLY if the maximum contaminant level could leave the Central Plateau. If this were a MTCA process, this would be synonymous to selecting an alternate compliance point. Selection of the Central Plateau as an alternate compliance point is premature, without technical basis, without regulatory basis, and inappropriate. Considering the decision process depicted by Figure 2, the only time an action would occur is when “there is a potential for the plume to leave the Central Plateau above Maximum Contaminant Level”. This renders the second diamond on the figure unnecessary. As such, this implies no necessity to monitor specific waste units, but rather to only monitor at the perceived Central Plateau point of compliance. This is inappropriate and does not satisfy RCRA, MTCA or CWA groundwater protection standards. Again, if this figure is to be followed, Ecology should identify it is waiving its statutory authorities to protect Washington State groundwaters.

**Response:**

**Figure 2 and associated text describe a generalized decision logic for the assessment and remediation. Irrespective of the contaminant source (whether RCRA or CERCLA), it is prudent to address common contaminants under existing (interim or other) assessment and remediation objectives/plan.**

42. Section 5.2.2, Page 14. The section omits identification of additional applicable statutory authorities, specifically, MTCA and CWA. As such, the section is incomplete.

**Response:**

**See response to Comments 5 above.**

43. Section 5.3.5, Page 18. In general, the expectations, of compliance with RCRA and HWMA, identified in this section, are not supported by the strategy.

**Response:**

**Compliance with all applicable regulatory requirements is a fundamental objective of the Strategy. See the first bullet of Section 2.0, and the response to comment 13.**

44. Section 6.1, Pages 18-19. It is noted with interest, that none of the supporting documents were generated by Ecology or EPA. It appears this strategy is that of USDOE’s.

**Response:**

**Comment noted.**

45. Section 6.1, Page 19. It is stated: “Strategies set forth in this document.....may be reflected as appropriate in final enforceable decision documents and Tri-Party Agreement milestones and requirements.” As the strategy is not consistent with regulatory requirements or intent, it is strongly recommended that the strategy **not** be reflected in any final enforceable decision

document. Furthermore, the strategy completely **lacks** decision-making transparency and is therefore, nonenforceable. Again, it is strongly recommended that the strategy **not** be reflected in any final enforceable decision document.

**Response:**

**The Tri-Parties disagree with the commenter's statement that the strategy is not consistent with regulatory requirements. Since the strategy is a framework for unit-specific decision, and since it does not contain specific requirements for any particular unit, it is not intended to contain enforceable requirements. The Tri-Parties do, however, fully intend that unit-specific decision documents are developed based on the framework established in the strategy.**

- 46.** Appendix A. The appendix needs to be re-written to be consistent with WAC 173-303 regulations. The use of the term "regulated unit" in quotation marks is not understood. Therefore, as the document appears to attempt to use definitions that are included in -040, it is recommended that the appendix include an identification of when the words mean the same definitions as those of -040. Without such indications and identification, the appendix lacks transparency. Also, the appendix needs to be re-written to identify how MTCA requirements are being satisfied.

**Response:**

**The term "regulated unit" in Appendix A of the strategy is defined identically to the definition in WAC 173-303-040. To provide the requested clarification, the second sentence of Appendix A will be revised to read:**

**"The first, and more traditional, relates to releases to groundwater from land-based "regulated units, " defined in WAC 173-303-040 as landfills, land treatment units, surface impoundments and waste piles."**

**Otherwise, the Tri-Parties believe that Appendix A is fully consistent with WAC 173-303 regulations. With respect to MTCA requirements, see the response to Comment 5.**

From: SCN User [mailto:bg590@scn.org]  
Sent: Thursday, May 01, 2003 3:56 PM  
To: Hedges, Jane (ECY)  
Subject: Comments on the Draft Hanford Site Groundwater Strategy

Madam:

I have read through the Draft Hanford Site Groundwater Strategy (DOE/RL-2002-59), and would like to make the following comments. (If you're not the right person to send them to, I'm hoping you'll know where to forward them):

First, I think this document could use a thorough proofreading. Some of the obscurities and obfuscations may be a matter of undefined technical terms (for example, on page 10, there's a line reading 'Determine hydraulic head to determine groundwater flow rate and direction'; a phrase that is effectively meaningless to me as a layperson). Other problems, however, seem to be a product of inadequate editing (for example, on page 12, there's a line that describes 'the mass of contaminant that constitutes a threat to groundwater degradation' (emphasis added). Any threat to groundwater degradation needs to be encouraged :-)--it's threats of groundwater degradation that need watching. Also, in at least one place, the word 'us' is mistakenly used for 'use'). These types of mistakes cannot be caught by spellcheckers--actual proofreading is necessary.

**Response: Additional text editing has been conducted on the document.**

Second (and this is a general problem, not specific to this document), there are many references to legal and code standards, but the standards are simply cited, not quoted or described. This would be a minor problem to people who have these standards (most notably, in this case, 173-303-645, which is cited on nearly every page) available for reference. For those of us who are working out of our homes and have no website access, it's a major problem.

**Response: Additional explanation of references to legal and code standards has been added to the document**

Third (and more critically), there are a great many statements about who doesn't regulate radiological contamination, but little discussion of who does, and how. The AEA is mentioned, but glancingly, and discussions of standards and practices for dealing with radiological contamination are sketchy at best.

**Response: The revised text provides additional information on standards and regulations for radiological contamination**

Lastly, (and most importantly), this document focuses almost exclusively on monitoring and prevention, with almost nothing dealing with what to do with existing contamination. The general argument seems to be 'We'll wait to deal with that until our magic wands come in'. Magic wands are on indefinite back-order :-). New technologies that will instantly and miraculously clear the contamination are equally uncertain. For now, we have to plan how to treat this contamination with presently available science and technology. By all means characterize the contamination, and work out how it will



spread, as thoroughly as possible. But adopting a 'cross your fingers and hope' attitude is not sufficient--there needs to be more emphasis on treatment.

**Response:** The intent of this document was to establish a framework for characterization, monitoring, groundwater protection and remediation. A detailed discussion of the on going activities and plans and schedules for remediating the existing groundwater contamination is provided in the recently completed plan "Hanford's Groundwater Management Plan: Accelerated Cleanup and Protection," DOE/RL-2-2-68, March 2003. This document can be found on line at <http://www.hanford.gov/cp/gpp/library/programdocs.cfm> .

I look forward to seeing a revised draft of this document, and would like to request that I be sent future documents on this subject.

**Response:** The revised document will be available on the WEB sometime in July.